

InteliDrive FLX LITE

Engine Controller for Pumps and Compressors

SW version 2.3.0

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1 Document information

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1.1 Clarification of notation

Note: This type of paragraph calls readers attention to a notice or related theme.

IMPORTANT: This type of paragraph highlights a procedure, adjustment etc., which can cause a damage or improper function of the equipment if not performed correctly and may not be clear at first sight.

Example: This type of paragraph contains information that is used to illustrate how a specific function works.

1.2 About this guide

This manual contains important instructions for ID-FLX Lite controllers family that shall be followed during installation and maintenance of the InteliDrive Lite engine controllers.

This manual describes ID-FLX Lite application examples for single engine applications.

This manual provides general information how to install and operate InteliDrive Lite controller.

This manual is intended for operators of engines, for engine control panel builders or for everybody who is concerned with installation, operation and maintenance of the engine applications.

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Warning: Some forms of technical support may be provided against payment. There is no legal or factual entitlement for technical services provided in connection to resolving problems arising from cyber-attack or other unauthorized accesses to ComAp's Products or Services.

General security recommendations and set of measures

1. AccessCode

- Change the AccessCode BEFORE the device is connected to a network.
- Use a secure AccessCode – ideally a random string of 8 characters containing lowercase, uppercase letters and digits.
- For each device use a different AccessCode.

2. Password

- Change the password BEFORE the device enters a regular operation.
- Do not leave displays or PC tools unattended if an user, especially administrator, is logged in.

3. Controller Web interface

- The controller web interface at port TCP/80 is based on http, not https, and thus it is intended to be used only in closed private network infrastructures.
- Avoid exposing the port TCP/80 to the public Internet.

4. MODBUS/TCP

- The MODBUS/TCP protocol (port TCP/502) is an instrumentation protocol designed to exchange data between locally connected devices like sensors, I/O modules, controllers etc. From it's nature it does not contain any kind of security – neither encryption nor authentication. Thus it is intended to be used only in closed private network infrastructures.
- Avoid exposing the port TCP/502 to the public Internet.

5. SNMP

- The SNMP protocol (port UDP/161) version 1,2 is not encrypted. Thus it is intended to be used only in closed private network infrastructures.
- Avoid exposing the port UDP/161 to the public Internet.

1.4 Document history

Revision number	SW version	Date	Author
9	2.3.0	17.4.2019	Lukáš Bečka
8	2.3.0	28.3.2019	Lukáš Bečka
7	2.3.0	25.3.2019	Petr Weinfurt
6	2.3.0	13.3.2018	Petr Weinfurt
5	2.2.0	19.1.2016	Petr Weinfurt
4	2.1.0	9.11.2015	Zdeněk Rojka
3	1.9.0	17.12.2014	Jaroslav Juriga
2	1.8.0	13.5.2014	Jaroslav Juriga
1	1.7.0	5.5.2013	Jaroslav Juriga

Note: ComAp believes that all information provided herein is correct and reliable and reserves the right to update at any time. ComAp does not assume any responsibility for its use unless otherwise expressly undertaken.

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1.5 Language support

InteliDrive Lite controllers support different languages. In default setting of controller are accessible two languages English, which isn't possible remove and Chinese. In the controller is possible to substitute Chinese language by next language via LiteEdit (see the table below). These languages are possible modify via Translator tool in LiteEdit.

Following language code pages are supported:

Code page	Language	Windows code
0	West European languages	Windows 1252
134	Chinese	GB 2312
161	Greek	Windows 1253
162	Turkish	Windows 1254
177	Hebrew	Windows 1255
204	Russian	Windows 1251
238	East European languages	Windows 1250

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2.1 Warnings

InteliDrive Lite controller can be remotely controlled. In case of the work on the engine check, that nobody can remotely start the engine.

To be sure:

- ▶ Disconnect remote control via RS232 line,
- ▶ Disconnect input REM START/STOP or
- ▶ Disconnect output STARTER

Note: *Because of large variety of InteliDrive Lite parameters setting, it is not possible to describe all combination. Some of InteliDrive Lite functions are subject of changes depend on SW version. The data in this manual only describes the product and are not warranty of performance or characteristic.*

Note: *SW and HW must be compatible (e.g. ID-FLX Lite firmware and ID-FLX Lite hardware) otherwise the function will be disabled. If wrong software is uploaded the message HARDWARE INCOMPATIBLE appears on the controller screen.*

In the case of using Boot load (jumper) programming – close Boot jumper, follow instruction in LiteEdit and upload correct software.

2.2 General description

The key feature of InteliDrive Lite is its easy-to-use operation and installation. Predefined configurations for typical applications are available as well as user-defined configurations for special applications.

InteliDrive Lite is a comprehensive controller for single engines with extended support of electronic engines and plug-in modules.

InteliDrive Lite controllers are equipped with a powerful graphic display showing icons, symbols and bar-graphs for intuitive operation, which sets, together with high functionality, new standards in engine controls.

InteliDrive Lite provides gas engine support without ventilation.

Controller supports WebSupervisor system. This system enables engine fleet and assets management as well as pure monitoring. Visit www.comap-control.com and www.websupervisor.net for more details about WebSupervisor.

The key features are:

- ▶ ECU support - for singlespeed and allspeed engines e.g. Cummins, Volvo, JohnDeer etc.
- ▶ Flexibility - with our extension modules e.g. IL-NT AIO, IL-NT BIO8 etc.
- ▶ Communication - via communication modules e.g. IL-NT-GPRS, IB-Lite, IL-NT-S-USB and PC tools Web

Server, WebSupervisor, IntelliMonitor etc.

- ▶ Process logic – active control of engine, history log, configuration-no programming.

2.3 Configurability and monitoring

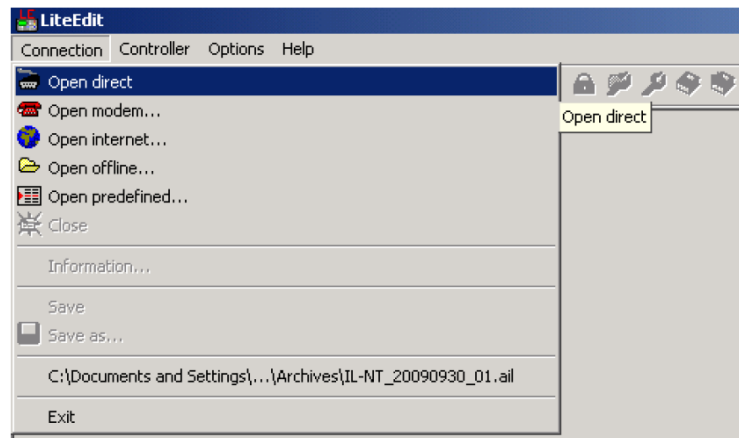
InteliDrive Lite is using as configuration, monitoring and controlling tool LiteEdit software. For simple configuration, monitoring and controlling can be used IntelliMonitor.

InteliDrive Lite controller also supports remote monitoring and control via internet, AirGate or cellular network connection. For this remote control are used web tools WebSupervisor and Web Server.

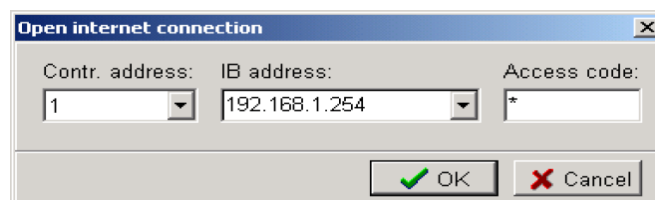
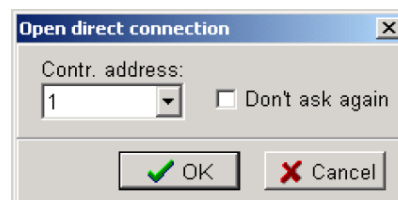
2.3.1 Open connection from LiteEdit

PC tool LiteEdit is used for monitoring, programming and configuration of ID-FLX Lite controllers.

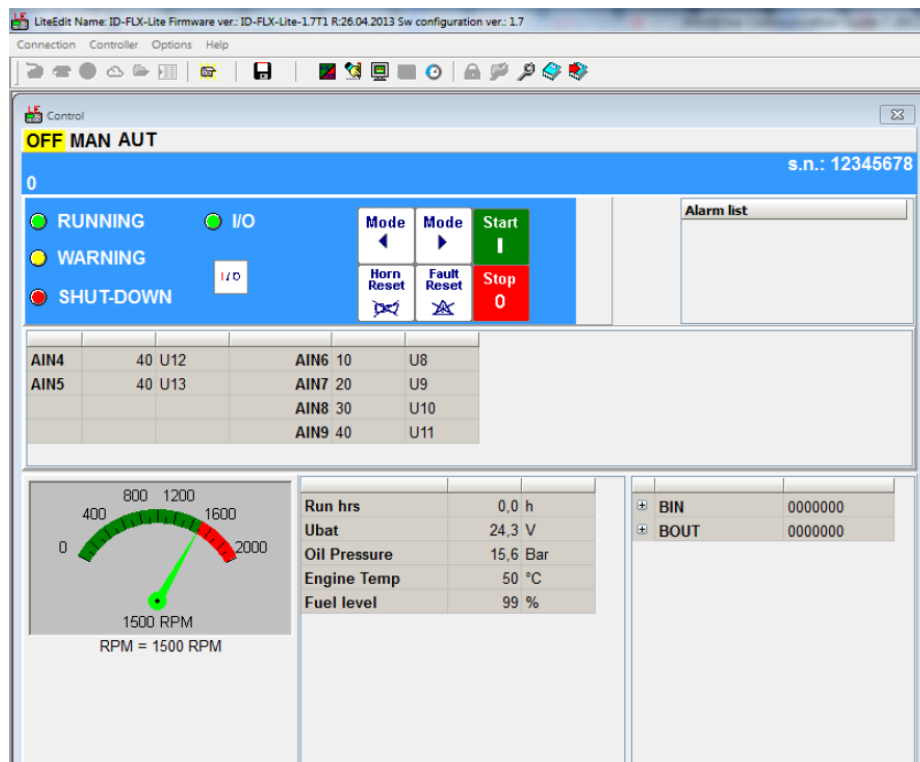
1. Go to menu Connection and select the type of connection you desire.



2. Enter controller address and further information depending on the selected connection type.



3. You will see the Control window and you can continue with configuration of Setpoint, inputs, outputs etc.

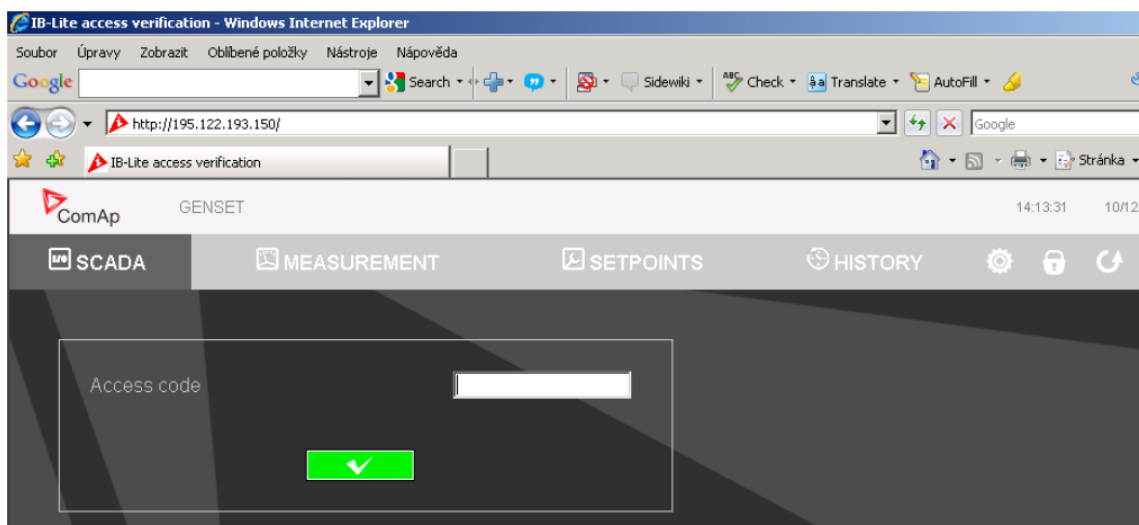


Note: For detail description of LiteEdit and IntelliMonitor PC tools see [LiteEdit Reference Guide](#), [IntelliMonitor Reference Guide](#) and [IntelliDrive Communication Guide](#).

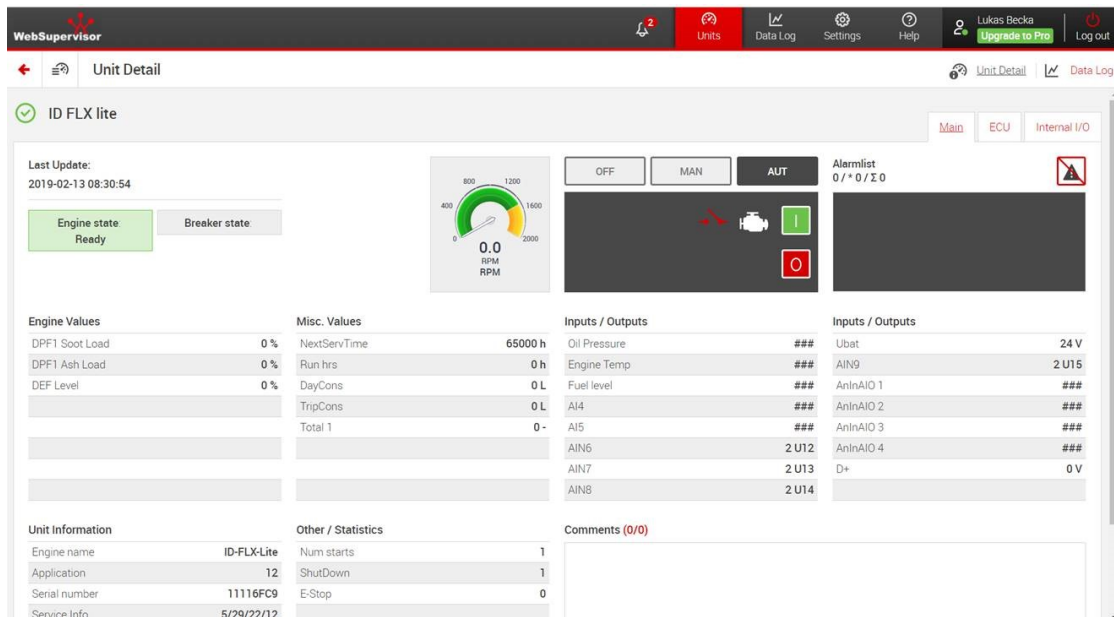
2.3.2 Open connection from web browser

It is possible to connect from a web browser to IntelliDrive Lite controllers, mounted with IB-Lite module (or IB-NT with specific conditions) and connected to internet.

1. Open web browser
2. Enter IP address from controller **IBLite IP Addr (page 105)**
3. Access verification page appears



4. Enter access code and Scada page appears



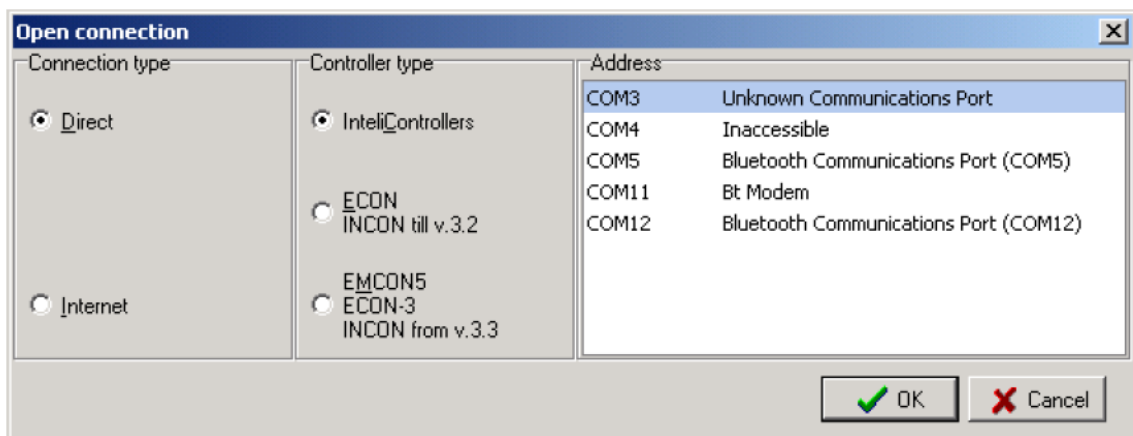
Note: You can try the Web Server from ComAp webpage. The access code is 0.

Note: WebSupervisor is possible to use as a control and monitor tool. For access is necessary to be registered. Connection setting and other information you can find in [WebSupervisor Global Guide](#).

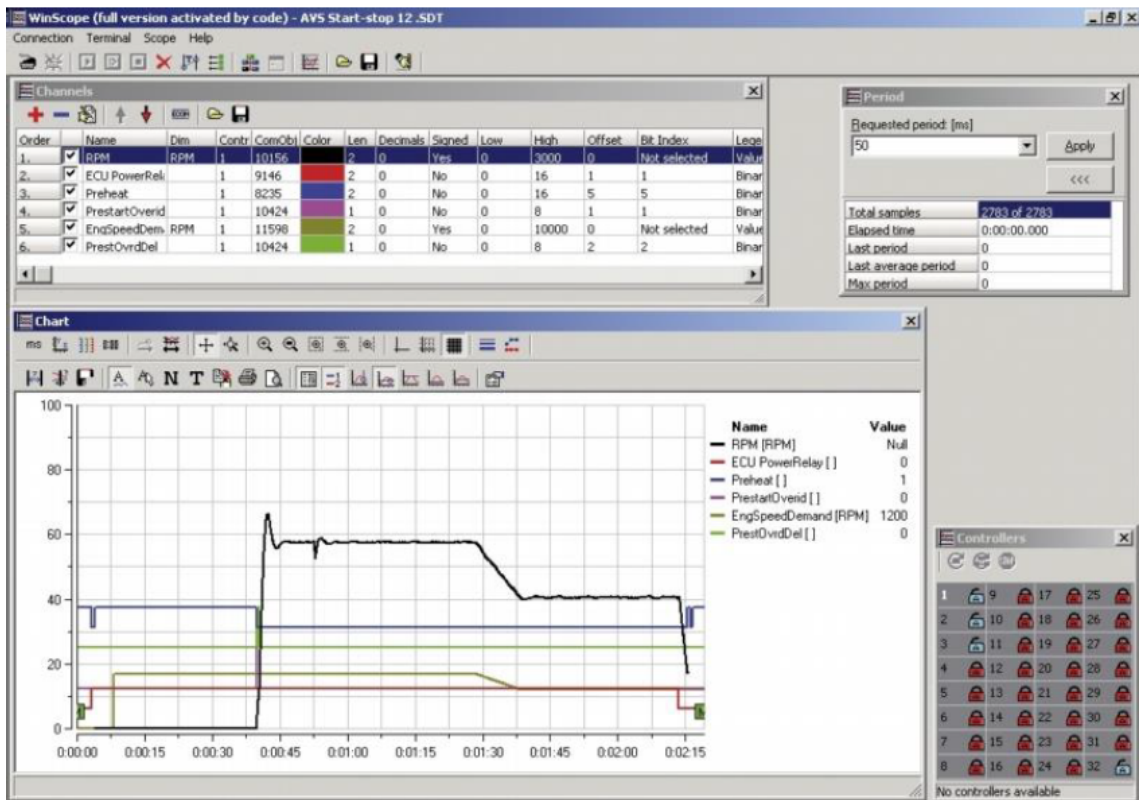
2.3.3 Open connection from WinScope

WinScope is powerful PC tool for observation of controller's states and measurements.

1. Go to menu Connection -> Open connection... and select the type of connection you desire in Open connection window (Inteli controllers).



2. Proceed with selection of channels etc. according to [WinScope Reference Guide](#).



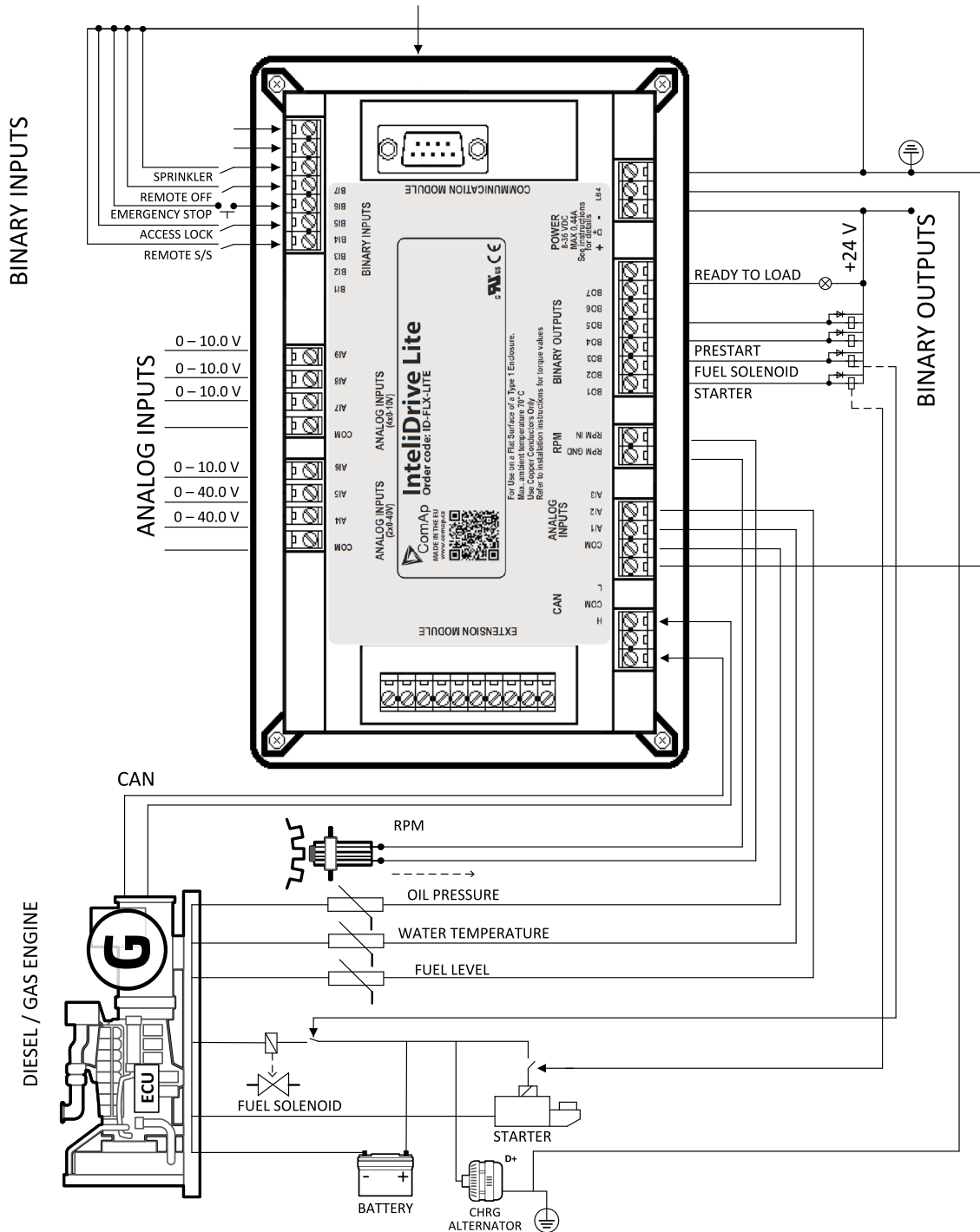
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3 Applications overview

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Basic wiring scheme for single engine, all engine data are transferred from ECU via CAN J1939 interface in example below.

Note: The extension IGL-RA15 modules can be connected to CAN bus together with ECU.



4 Installation and wiring

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4.1 Mounting

The controller is used to be mounted onto the switchboard door. Requested cutout size is 17 × 112 mm. Use the screw holders delivered with the controller to fix the controller into the door as described on pictures below.



4.2 Package contents

InteliDrive Lite controller is delivered in the box as one set containing the:

- ▶ ID-FLX Lite controller programmed with default configuration
- ▶ 4x Fixing clips
- ▶ Complete connectors (female) set for controller wiring.

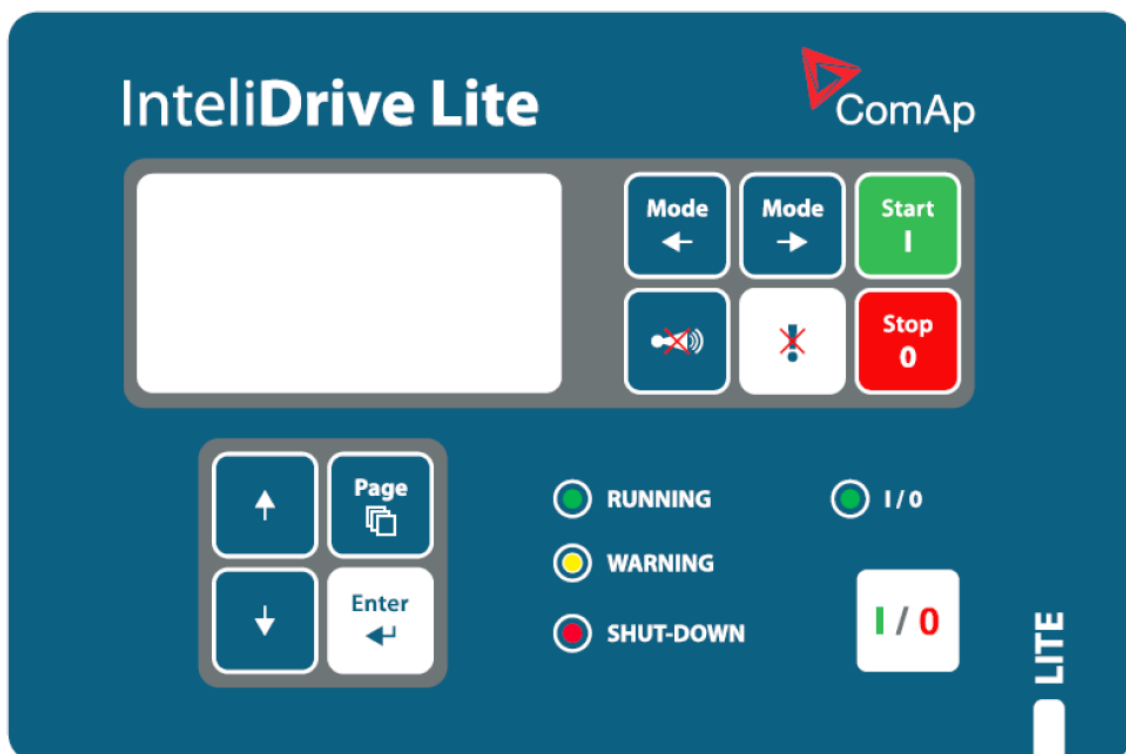
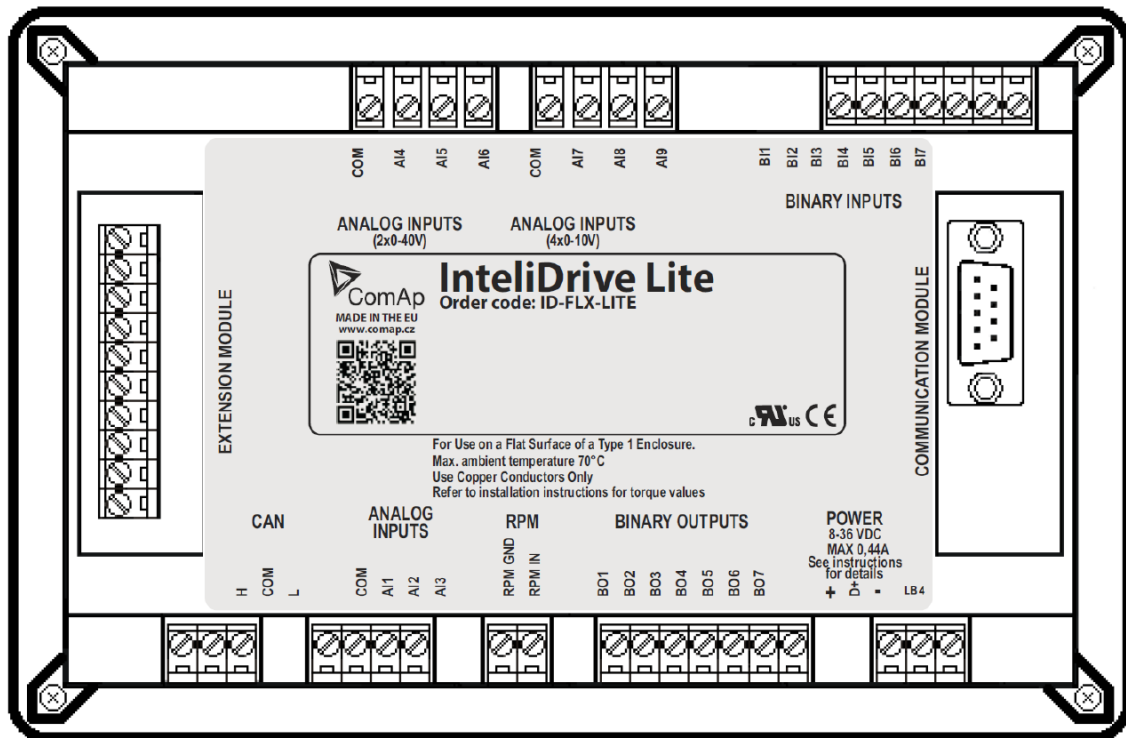
4.2.1 Software package

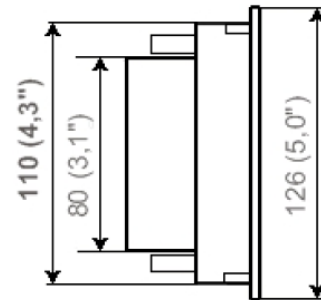
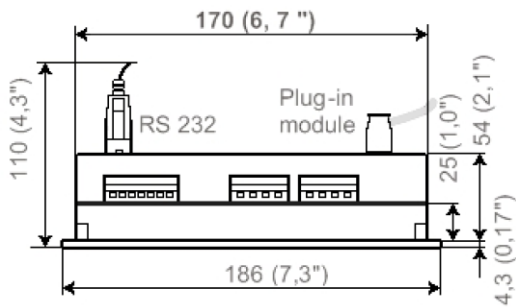
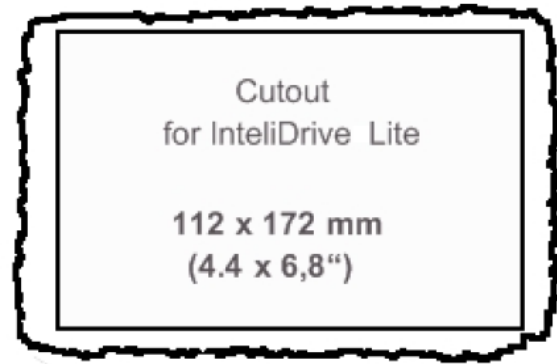
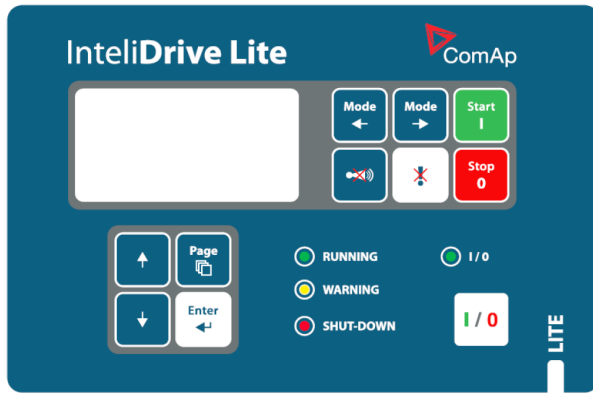
ID-FLX Lite is distributed as ID-FLX-Lite-x.y.iwe package and it is compatible with the PC tool LiteEdit x.y.z and ECU list-x.y, where x, y, z are numbers of software version. Find installation files on ComAp web. Version of published files on the webpage are compatible each other.

4.2.2 Components

Accessories	Description	Optional / Obligatory
ID-FLX Lite	InteliDrive Lite central unit	Obligatory
Communication plug-in		
IL-NT RS232	RS232 communication card	Optional plug-in
IL-NT RS232-485	Combined communication card	Optional plug-in
IL-NT S-USB	USB communication card	Optional plug-in
IB-Lite	Ethernet/Internet interface	Optional plug-in
IL-NT GPRS	GSM/GPRS modem	Optional plug-in
Extension plug-in		
IL-NT AOUT8	8 AOUT Gauge driver card	Optional plug-in
IL-NT AIO	4× AIN + 1× AOUT	Optional plug-in
IL-NT IO1	4× BIN + 4× AOUT	Optional plug-in
IL-NT BIO8	8× BIN or BOUT	Optional plug-in
External modules		
IL-NT RD	Remote display	Optional external
EM2IGLRABAA	Remote annunciator	Optional external
IB-NT	Communication module (3G, Ethernet)	Optional external
EM2FPCRAEAA	Remote annunciator Firepump AS2941	Optional external

4.3 Terminal diagram and dimension






4.4 Extension plug-in modules

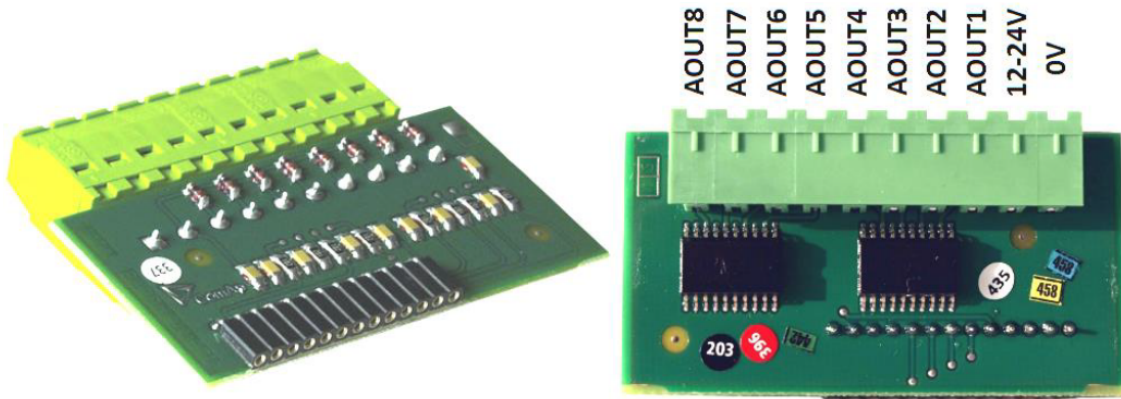
4.4.1 Extension plug-in modules installation

To insert the module, you must open the cover first (use screwdriver to open) and then insert the module into slot. Once you have inserted it, the module will snap under plastic teeth. It is supposed to be installed permanently. Should you need to remove it, the safest way is to remove whole back cover and than remove module manually.

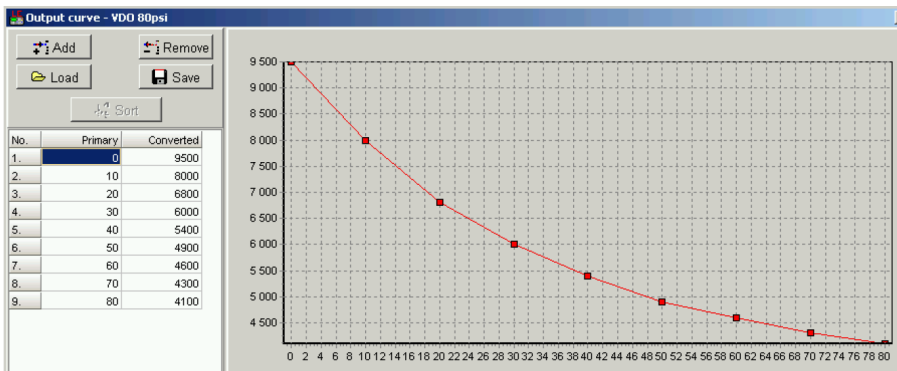
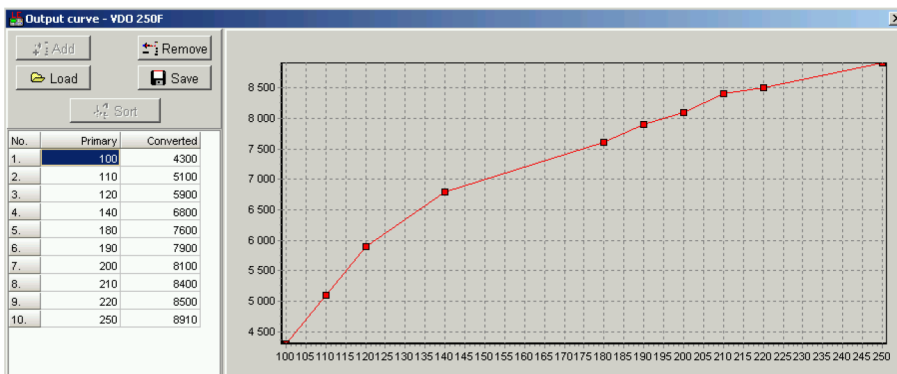
For configuration of extension plug-in modules go to LiteEdit and press  button in Modify configuration window.

4.4.2 IL-NT AOUT8

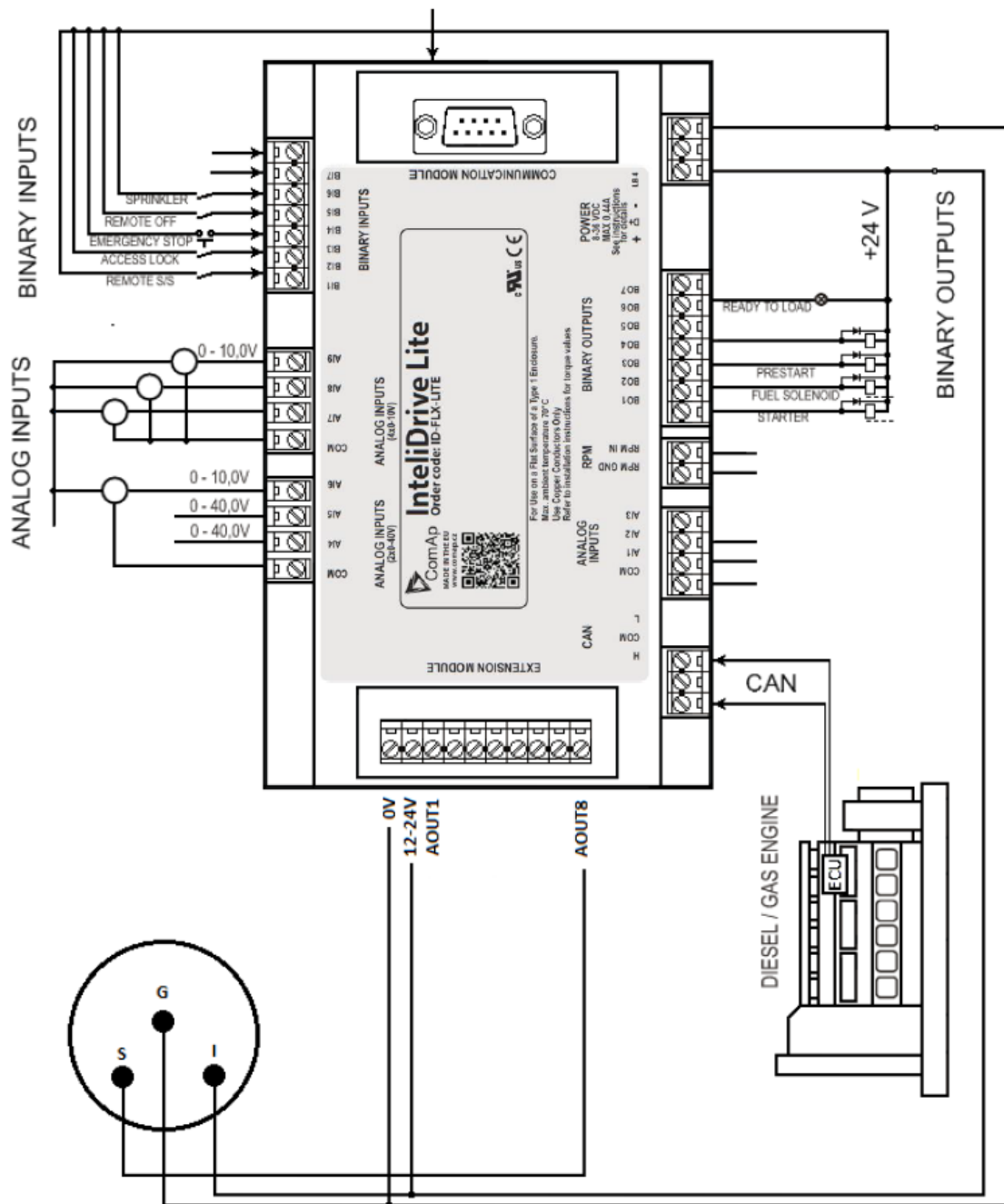
IL-NT AOUT8 is optional plug-in card. Through this card can the controller drive up to 8 VDO style industrial/automotive gauges. This is to provide visual indication of typically ECU values without installing additional sensors on the engine. PWM signal emulates sensor which would be typically mounted on the engine. Sensor/gauge curve and value are configured in LiteEdit PC tool. Any analog value from the controller may be configured to the outputs. All outputs operate as PWM signal at 1200 Hz.



Example: Default analog output curves

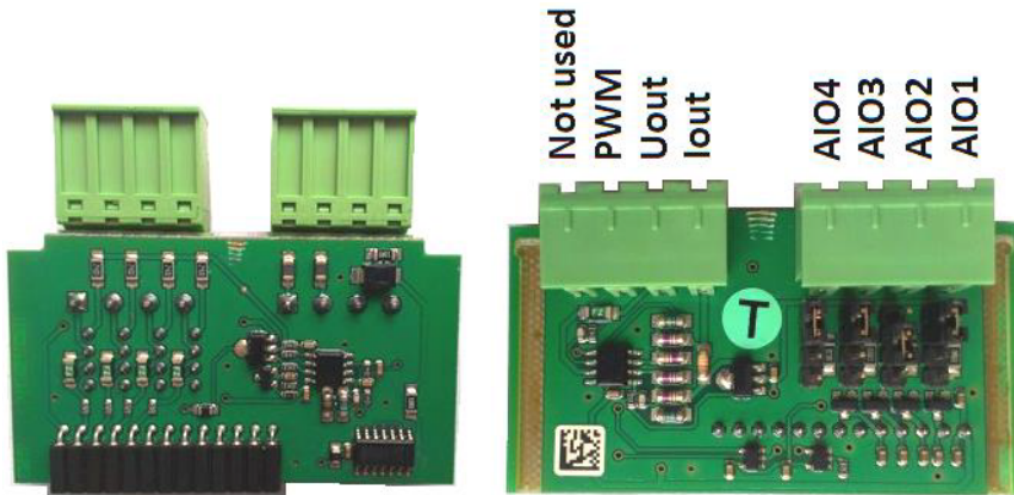


Example: Wiring for Dacon gauges and IL-NT-AOUT8



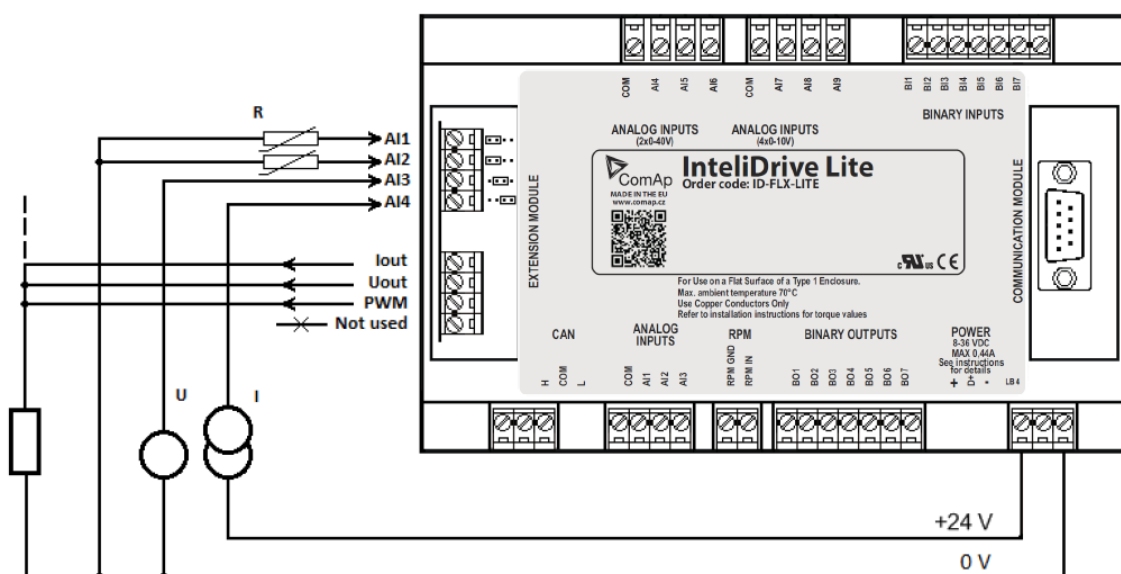
4.4.3 IL-NT AIO

IL-NT AIO is optional plug-in card. This card offers additional four analog inputs and one analog output. Analog inputs can be used for different types of sensor (resistive, current and voltage) and variable analog output, which can be used as PWM. Adjustment of extension plug-in module is possible via LiteEdit too.



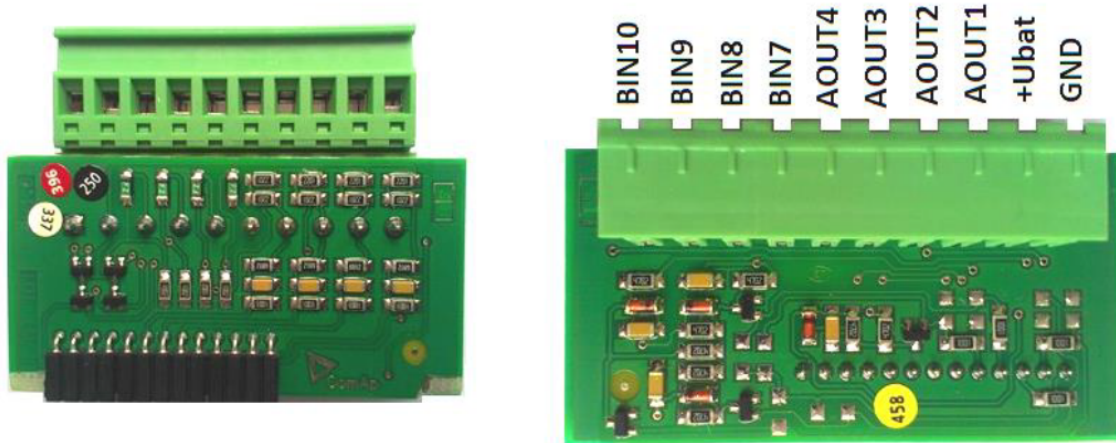
Type of analog input is selectable by jumper. Each analog input has own line of jumper position. The top position (closest to green connector on the pic above) is for resistive input, central position for voltage input and lowest position is for current input.

AI1 – AI4	2600 Ω / 4 V / 20 mA
Iout	0 – 20 mA (max 22 mA) max 100 Ω load
Uout	0 – 4.5 V (max 10 mA)
PWM	PWM 5 V / 15 mA / 500 Hz
Not used	Do not connect!



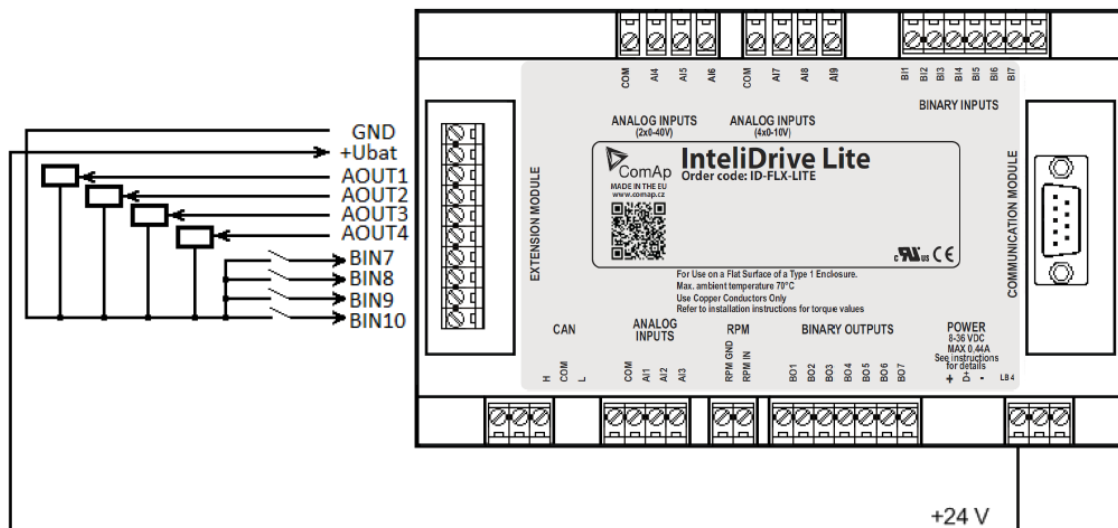
4.4.4 IL-NT IO1

IL-NT IO1 is optional plug-in card. Through this card controller can drive up to 4 proportional valves and to use 4 additional binary inputs. The 0 V (GND) terminal is internally wired with battery minus internally, the 12-24 V (+Ubat) terminal is wired to battery plus power supply of IntelliDrive Lite controller.



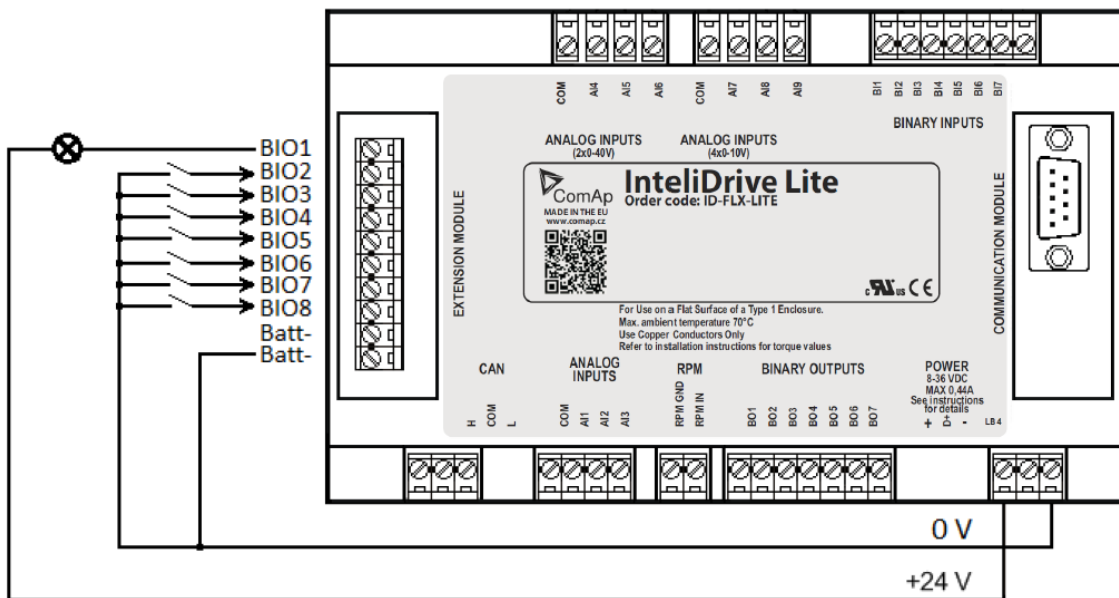
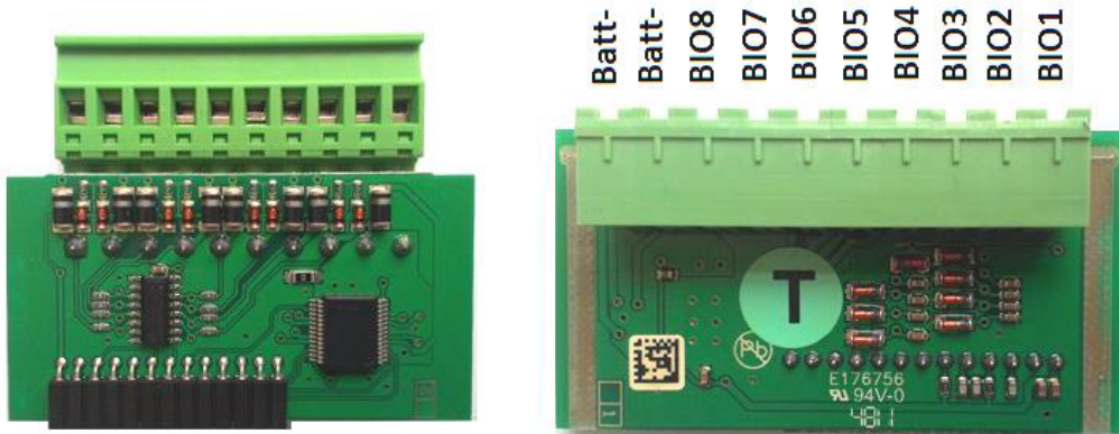
There should be, not more than 1 V, lower voltage compare to adjusted % of +Ubat voltage.

Note: Analog output shorted to ground more than one second can damage the output circuit.



4.4.5 IL-NT BIO8

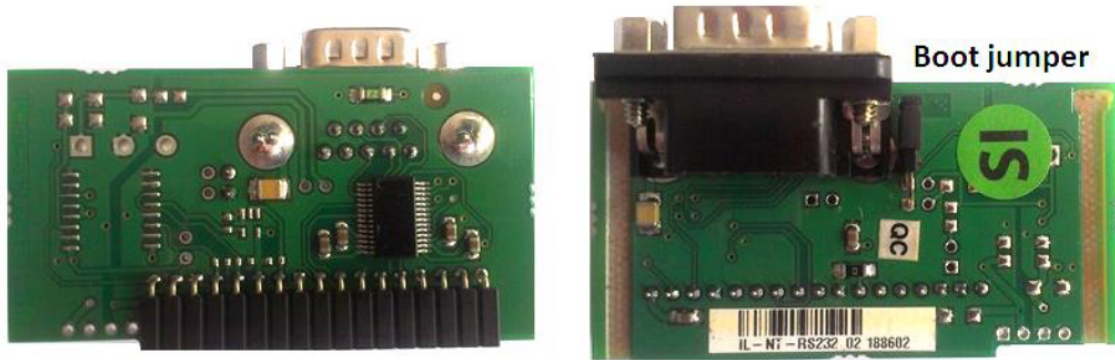
IL-NT BIO8 is optional plug-in card. Through this card controller can use up to 8 additional binary inputs or outputs. At least one Batt- terminal has to be connected to battery minus power supply of IntelliDrive controller, if at least one binary output is configured. In case more than 4 binary outputs are configured is necessary to connect both Batt- terminals.



4.5 Communication modules

4.5.1 IL-NT RS232

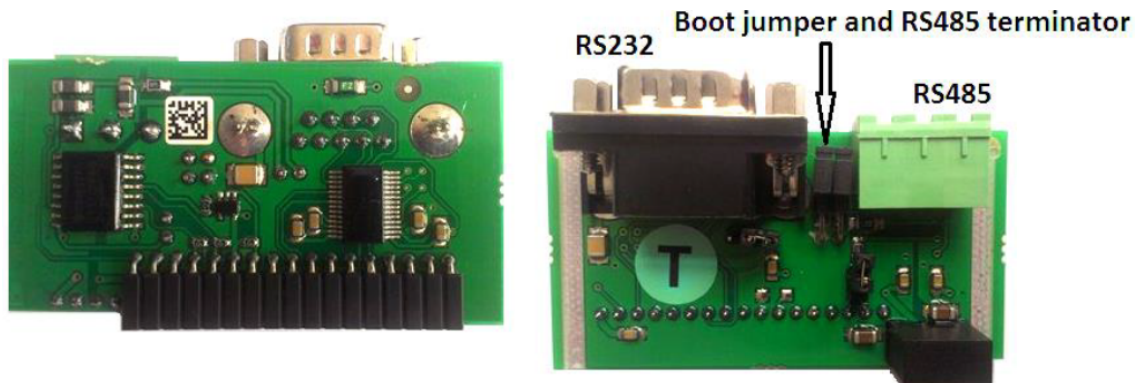
IL-NT RS232 is optional plug-in card, which enables IntelliDrive Lite controller for RS232 serial communication. This is required for computer or Modbus connection. The card has to be inserted into the expansion “Communication module” slot back on the controller, similarly to extension modules.



Boot jumper programming – In case of interrupted programming or other software failure is possible to use the boot jumper programming to restore controller to working order. Connect the controller to PC, run LiteEdit and wait until connection bar at bottom turns red. Then run programming process via menu Controller -> Programming and cloning – Programming. Select correct firmware and confirm dialog. Then follow instructions in LiteEdit.

4.5.2 IL-NT RS232-485

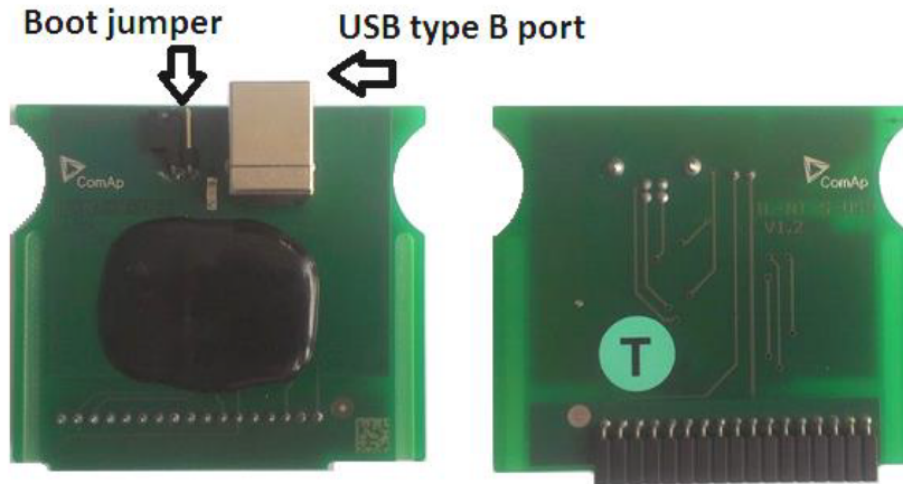
IL-NT RS232-485 is optional plug-in card, which enables IntelliDrive Lite controller RS232 and RS485 serial communication. This is required for computer or Modbus connection. The IL-NT RS232-485 is a dual port module with RS232 and RS485 interfaces at independent COM channels. The RS232 is connected to COM1 and RS485 to COM2. Adjustment of communication type, baud rate etc. is via Comms Setting group of setpoint in LiteEdit or the controller screen.



4.5.3 IL-NT S-USB

IL-NT S-USB is optional plug-in card to enable communication of IntelliDrive controller via USB port. This is required for computer or Modbus connection. This module contains USB slave port, which is connected internally to the COM1 of the controllers. It is designed as an easy removable service module.

This module requires a FTDI USB Serial converter driver installed in the PC. The driver creates a virtual serial port (COM) in the PC, which must be used in LiteEdit as communication port when a connection is being opened.



Note: The FTDI driver is installed together with LiteEdit.

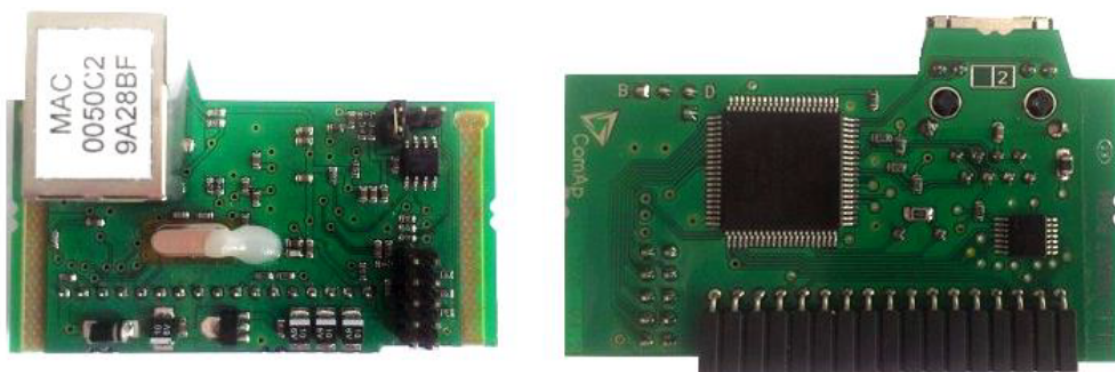
Note: When the USB cable from the controller is plugged-in first time into different USB ports on the PC including USB hubs, it can be recognized as new hardware and the drivers are installed again with different number of the virtual serial port.

IMPORTANT: Use shielded USB cable only! (ComAp order code: USB-LINK CABLE 1.8 m).

4.5.4 IB-Lite

IB-Lite is a optional plug-in card with Ethernet 10 / 100 Mbps interface in RJ45 connector. The card is internally connected to both COM1 and COM2 serial channels and provides an interface for connecting a PC with LiteEdit or IntelliMonitor through Ethernet network, for sending active e-mails and for integration of the controllers into a building management (Modbus / TCP protocol).

This card also enables to monitor and control the consumption engines over web browser from any location with internet access using appropriate security measures.



Note: Use Ethernet UTP cable with RJ45 connector for connection of the module into your Ethernet network. The module can be also connected directly to a PC using cross-wired UTP cable.

Note: The module requires configuration settings before usage. See [IB-Lite Global Guide](#).

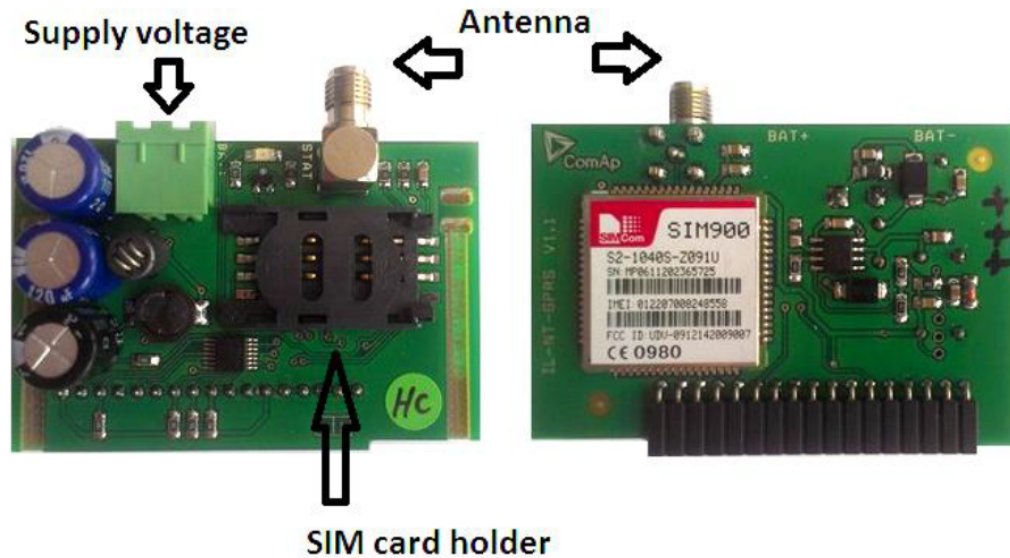
4.5.5 IL-NT GPRS

IL-NT GPRS is optional plug-in card, which works as GSM / GPRS modem which can work in two modes of operation based on settings in setpoint COM1 Mode.

Settings DIRECT = module works in GPRS network and enables connection via AirGate to LiteEdit and WebSupervisor as well as sending SMS alarms.

Settings MODEM = module works as standard GSM modem enabling CSD (Circuit Switch Data) connection to controller with LiteEdit or other ComAp PC SW and sending alarm SMSes.

Module is usually used for connection to remote monitoring and controlling system WebSupervisor websupervisor.comap.cz or to PC tools. Module is capable of sending alarm SMS based on settings in SMS / Email setpoint group.



IMPORTANT: Any manipulation with plug-in module shall be done with disconnected power supply to both controller and module. Power supply shall be switched on also is same time to both module and controller. Fail to follow these instructions (power supply active only in controller or only in module) can lead to module or controller failure!

IMPORTANT: GPRS and CSD connection is not suitable for firmware update process, kindly used wired connection instead like RS232, USB, RS485 or Ethernet via IB-Lite!

Note: Quick guide how to start using this module is in chapter Remote Communication – Short guide how to start using IL-NT GPRS module or on www.comap-control.com.

Note: Use of this plug-in brings WSUP Locate function. This function allows monitoring actual engine position based on GSM signal information. The position is automatically updated and stored in WSV history. You can track the position of the engine in WebSupervisor even in history.

Note: Unlike GPS system, the function works indoor or wherever the GSM signal is. Precision of localization is not as precise as with GPS and depends on density of operator's GSM / BTS tower around the controller.

4.6 Remote modules

Remote modules allow monitoring and displaying of values and states away from main controller.

4.6.1 IL-NT RD (SW)

IL-NT-RD is remote display software for a controller. Remote display provides the same control and monitoring functions as controller itself. Remote display for IntelliDrive controllers uses standard IntelliDrive Lite controller

with Remote display software. No further programming of the display is required – unit is self configurable from the main controller.

All remote display's LEDs show the same state as corresponding LEDs on master controller. Front panel buttons on both controllers work in the same way. Engine can be controlled from remote display as well as from master controller. User can switch screens, set password, change setpoints and view history records.

All IL-NT-RD screens Init, Measure, Setpoints and History display the same data like in the master controller.

Master device is always able to work without connected Remote display.

Interruption of the serial line between master device and Remote display has no effect to the master controller.

If the serial line between master device and remote display is interrupted, or communication cannot be established, remote display shows it's Init screen and message "Trying" and all LED's are off.

Once remote display finds compatible master it shows "Preparing" and downloads configuration table from master controller.

After the configuration from master is downloaded remote display jump to master controllers Init screen and all LEDs and blinking.

It is possible to switch to remote displays Init screen to check it's version and serial number of used controller and communication status by pressing PAGE button for 3 seconds.

IMPORTANT: It is highly recommended to use the same type and model of controller for master and remote display. Only in such case is assured the proper function of all buttons, LED diodes and display. Another combinations of HW types and models from Master controller and remote display are neither supported nor tested.

4.6.2 IL-NT RD software installation

The IL-NT-RD remote display firmware is installed in the same way as any other IntelliDrive firmware using LiteEdit. Please see [LiteEdit Global Guide](#) for details about upgrading firmware. IL-NT-RD consists only firmware, not an archive.

However when there is IL-NT-RD firmware installed in the controller the procedure to install back the original standard firmware is following:

- ▶ Open any type of online connection.
- ▶ DDE server will try to open the connection, but it will fail and write red error message in the status bar.
- ▶ In this moment go to CONTROLLER -> PROGRAMMING AND CLONING -> PROGRAMMING and select proper firmware you want program to the controller. Choosing the wrong type of firmware may result in non-functional controller.
- ▶ Press "OK" button to program the firmware to the controller.
- ▶ It may be required to switch off power supply of the controllers, close the boot jumper and switch on controller again. Follow the information windows accordingly.
- ▶ After programming is finished (it may be required to power off controller, open the boot jumper and power it on again) open configuration window and perform the configuration process manually. There is no compatibility of the configuration between different firmware versions.
- ▶ In some cases the "wrong setpoints" message can occur in the DDE server status line and controller is blocked showing "Init" state. Use CONTROLLER -> RESET FROM INIT STATE menu item to put the controller to normal operation. Be sure you have checked all setpoints before.

IMPORTANT: Check the statistic value "Engine hours" after firmware upgrade. Change of statistical values if necessary is possible only by LiteEdit software (password is required).

4.6.3 IL-NT-RD Wiring

IL-NT-RD can be connected to IntelliDrive Lite controller via RS232 or RS485 communication line. It is possible to connect only up to two remote displays to one master controller, if they are using different communication COMs. It is not supported to connect two or more remote displays to one communication line, eg. RS485. It is possible to monitor only one master controller from one remote display at the time.

Connection process:

Remote display after power on automatically starts to search for any master controller connected. It starts to search on COM1 from master controllers address 1 to 32 and later on COM2 from address 1 to 32. Remote display tries two communication speeds 38400 bps and 56000 bps.

During this process is displayed text “Detecting...” on screen and progress bar below counts from 0 to 100 %. This process takes approx. 10 – 15 seconds. Than is 5 seconds pause and process continues again until compatible master controller is found.

Not supported types of controllers, not supported application, or controllers that are not properly communicating are skipped during the search.

Controller type selection:

IL-NT-RD automatically detects controller type.

Troubles with connection:

There are few reasons why remote display can not connect with master controller:

- ▶ Not supported type of controller connected (Eg. IGS-NT, ID-DCU, IC-NT, IGS-CU, etc.)
- ▶ Not supported firmware in master controller
- ▶ Configuration table error in master controller
- ▶ Wrong settings of setpoint COMx Mode in master controller
- ▶ Wrong connection, wiring, communication fail

Communication lines:

It is connected with the controller via IL-NT RS232 communication modules using RS232 line (up to 10 m). Longer distances (up to 1200 m) are possible using IL-NT RS232-485 communication module or when RS232 / RS485 converters are used.

It is possible to make a RS232 direct connection with IL-NT RS232 module on one side and IL-NT RS232-485 module on the other side.

4.6.4 IGL-RA15 (EM2IGLRABAA, EM2FPCRAEAA)

The remote annunciator IGL-RA15 can be connected to the IntelliDrive unit via CAN bus. Any of the binary outputs can be configured (using LiteEdit) to each LED diode on the RA15. The module can be also enabled or disabled using LiteEdit.

If IGL-RA15 remote annunciator is not communicating with a controller via CAN bus, it activates a warning.

Note: See the [documentation of IGL-RA15](#) for the technical description.



4.6.5 IB-NT

Internet bridge allows different type of communication and multiple controllers communication. Single IntelliDrive Lite controller is possible to connect via serial line RS232. For multiple controllers connection is necessary to use RS485 communication port.

IB-NT offers direct, internet, AirGate and cellular network type of communication.

Note: See the [documentation of IB-NT](#) for the detail description.



4.7 How to install

To ensure proper function:

Wiring for binary inputs and analog inputs must not be run with power cables.

Analog and binary inputs should use shielded cables, especially when length >3 m.

Note: During the configuration of controller or setpoints changes is required a password to the controller. The default password from ComAp is "0".

4.7.1 Grounding

To ensure proper function:

Use cable min. 2.5 mm².

Brass M4×10 screw with star washer securing ring type grounding terminal shall be used.

The negative "–" terminal of the battery has to be properly grounded.

Switchboard and engine has to be grounded in common spot.

Use cable as short as possible to the grounding point.

4.7.2 Wiring

Tightening torque, allowable wire size and type, for the Field-Wiring Terminals

▶ Based on terminal type

- PA256 – Specified tightening torque 0.5 Nm (4.4 In-lb)



- 2EDGK – Specified tightening torque 0.4 Nm (3.5 In-lb)



▶ For field type terminals

- Use only diameter 2.0 - 0.5 mm (12-26 AWG) conductor, rated for 75 °C minimum.

▶ For Generator Voltage terminals

- Use only diameter 2.0 - 0.5 mm (12-26 AWG) conductor, rated for 90 °C minimum.

IMPORTANT: Use copper conductors only!

4.7.3 Power supply

Use minimally power supply cable of 1.5 mm².

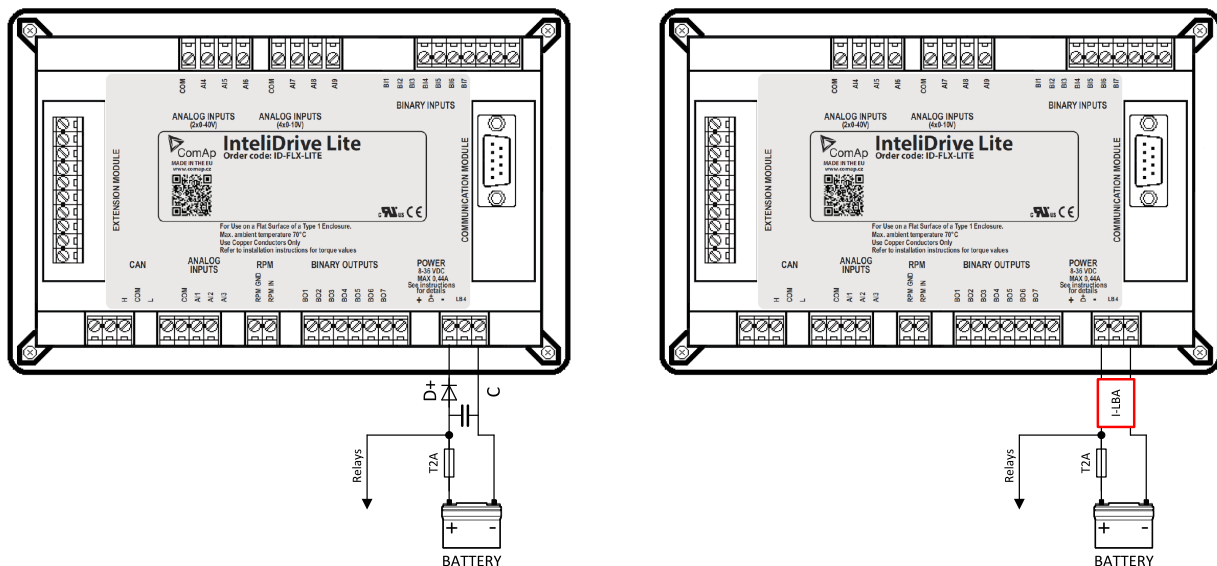
**IMPORTANT: Maximum continuous DC power supply voltage is 36 VDC.
Maximum allowable DC power supply voltage is 39 VDC.**

The IntelliDrive Lite's power supply terminals are protected against large pulse power disturbances. When there is a potential risk the controller being subjected to conditions outside its capabilities, an outside protection device should be used.

Note: The IntelliDrive Lite controller should be grounded properly in order to protect against lightning strikes!! The maximum allowable current through the controller's negative terminal is 4 A (this is dependent on binary output load).

For the connections with 12 VDC power supply, the IntelliDrive Lite includes internal capacitors that allow the controller to continue operation during cranking if the battery voltage dip occurs. If the voltage before dip is 12 V, after 150 ms the voltage recovers to 7 V, the controller continues operating. During this voltage dip the controller screen backlight can turn off and on but the controller keeps operating.

It is possible to further support the controller by connecting the external capacitor or I-LBA module.



The capacitor size depends on required time. It shall be approximately thousands of uF (microFarads). The capacitor size should be 5000 uF to with stand 150 ms voltage dip under following conditions:

Voltage before dip is 12 V, after 150 ms the voltage recovers to minimum allowed voltage i.e. 8 V

The I-LBA module ensures minimally 350 ms voltage dip under following conditions:

RS232 and other plug-in module is connected.

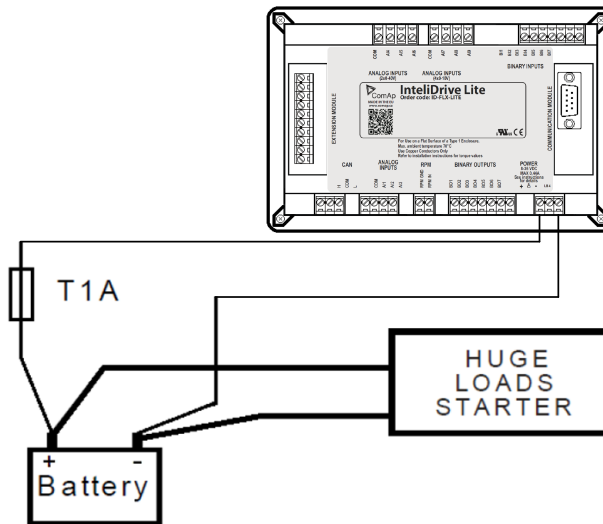
Voltage before dip is 12 V and after 350 ms the voltage recovers to minimum allowed voltage 5 V.

The I-LBA enables controller operation from 5 V (for 10 to 30 sec). The wiring resistance from battery should be up to 0.1 Ω for I-LBA proper function.

4.7.4 Power supply fusing

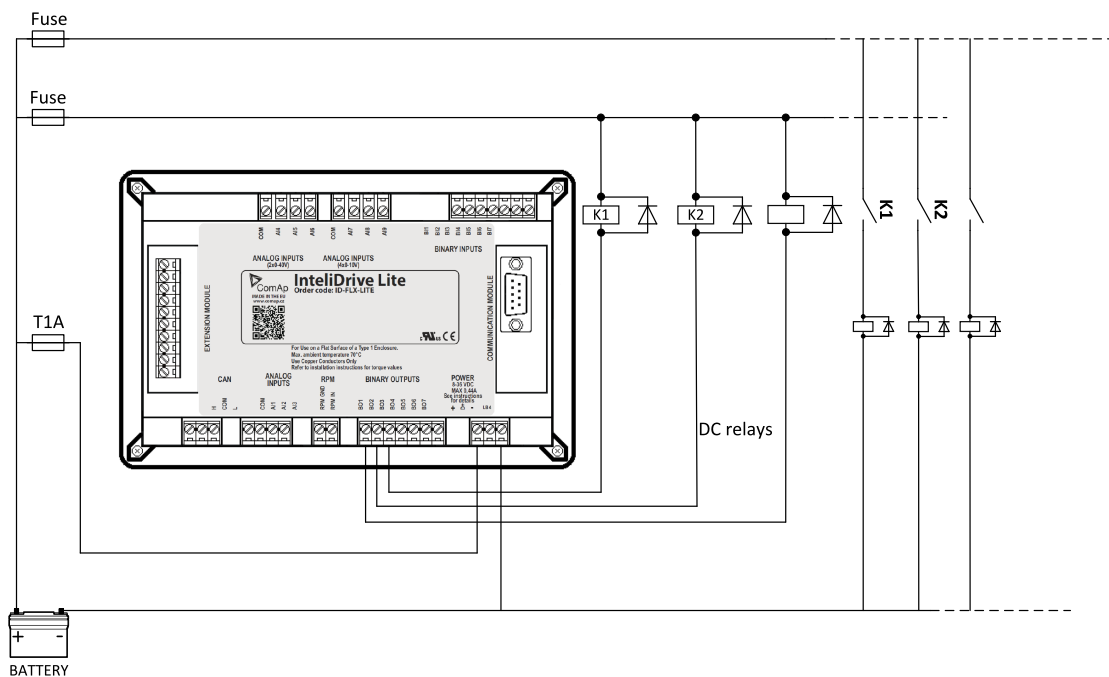
A one-amp fuse should be connected in-line with the battery positive terminal to the controller and modules. These items should never be connected directly to the starting battery.

Fuse value and type depends on number of connected devices and wire length. Recommended fuse (not fast) type – T1A. Not fast due to internal capacitors charging during power up.



4.7.5 Binary output protections

Do not connect binary outputs directly to DC relays without protection diodes, even if they are not connected directly to controller outputs.



4.7.6 Magnetic pick-up

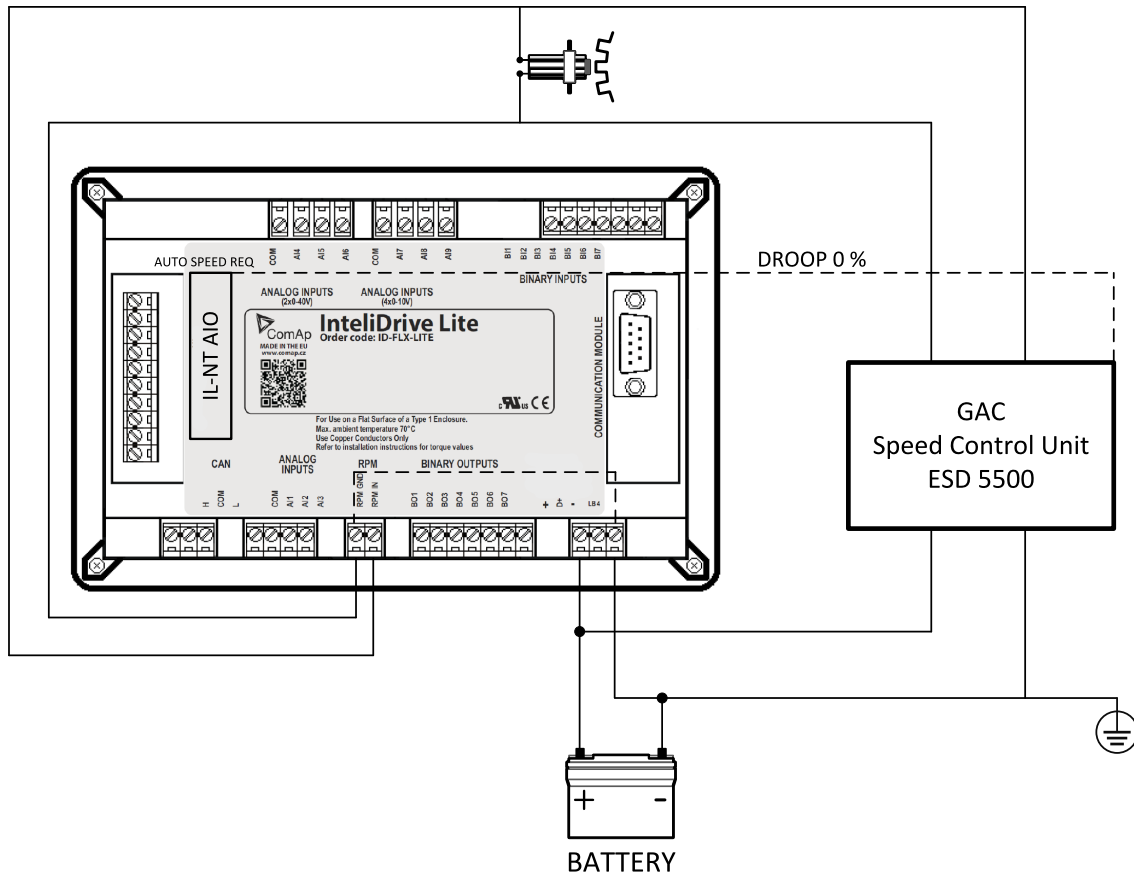
To ensure proper function:

Use a shielded cable

Be aware of interference signal from Speed governor, if one speed pick up is used.

If engine will not start:

- ▶ Check ground connection from pick-up to controllers, eventually disconnect ground connection to one of them
- ▶ Galvanic separate IntelliDrive Lite RPM input using ComAp separation transformer RPM-ISO (1:1)
- ▶ Use separate pick-up for Speed governor and IntelliDrive Lite.



Note: If $RPM > 2$ then the controller is in the state Not ready and the engine will not be allowed to start.

🔍 back to Installation and wiring

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5.1 Analog inputs

On the IntelliDrive Lite controller nine analog inputs are available. See the two tables here bellow with specific characteristics.

All here mentioned properties can be modified by LiteEdit PC tool only, in the window Modify .

5.1.1 Table of controller analog inputs

Input	Range	Default use	Configurability of default use
AIN1	0 – 2.4 kΩ	Oil pressure	NO
AIN2	0 – 2.4 kΩ	Engine temperature	YES
AIN3	0 – 2.4 kΩ	Fuel level	YES
AIN4	0 – 40 V	Not used - free	YES
AIN5	0 – 40 V	Not used - free	YES
AIN6	0 – 10 V	Not used - free	YES
AIN7	0 – 10 V	Not used - free	YES
AIN8	0 – 10 V	Not used - free	YES
AIN9	0 – 10 V	Not used - free	YES

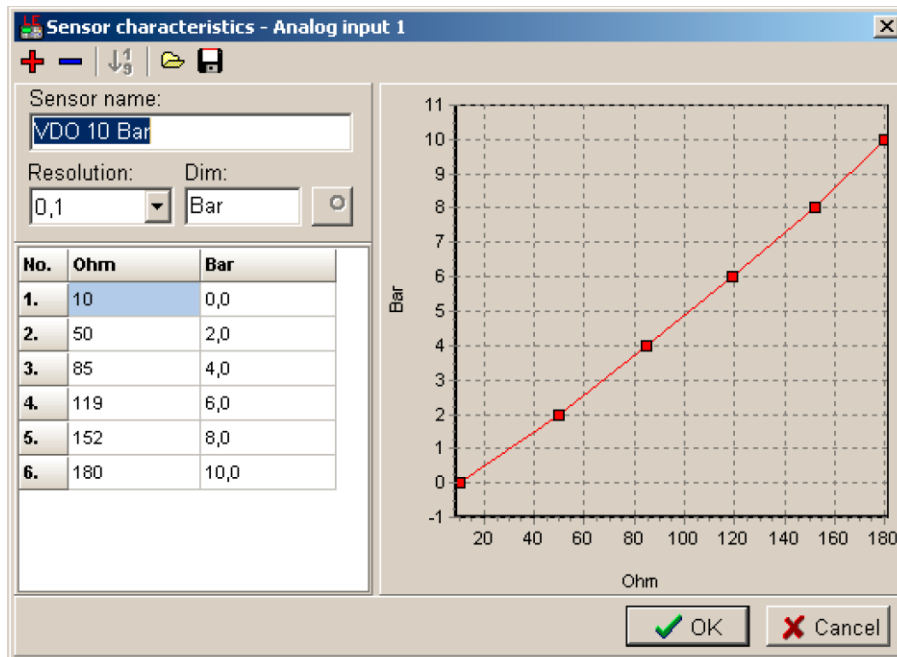
Note: The nominal range of Analog inputs measuring resistivity is 0 – 2.4 kΩ, nevertheless the input is able to measure up to 15 kΩ, but with lower precision.

Note: When Engine Control Unit is connected, it is possible to read IntelliDrive Lite Analog inputs values AIN1, 2, 3 from CAN bus (J1939).

5.1.2 Table of analog inputs options

LiteEdit	Modify	Possibility
Type	Not used	Analog input isn't used
	Alarm	Analog input is used for monitoring and protection
	Monitoring	Analog input is used only for monitoring
Name	... text	Up to 14 ASCII characters
	Name in history	Up to 4 ASCII characters for the name used in history records
Config	Analog	Analog measuring in specified range.
	Binary	Binary: open/close - threshold 750 Ω or 7 VDC (AIN6-AIN9)
	Tri state	Three (Triple)-state: open/close - threshold 750 Ω (only AIN1-AIN3), failure <10 Ω or > 2400 Ω
	ECU	Only for AIN1, 2 values are read from ECU unit
Alarm properties	Direction	Under limit
		Under step. Sensor fail does not activate protection.
		Over limit
Overstep. Sensor fail does not activate protection.		
UnderLimit+Fls		
Under step and Sensor fail activates protection.		
OverLimit+Fls		
Overstep and Sensor fail activates protection.		
Window prot.		
Combination of Under and Over protection at the same analog input		
Type	Type	Sensor fail
		Warning
		Wm+Sd
CoolDown		
Engine running only	Check box: Alarms are valid only for running engines, if box is checked	
Sensor	Sensor name	... text
		Resolution: number of decimal points
		Dimension: bar, %, °C, etc.
	Table and graph: customize curves	
Contact type	NC	Valid only for binary and three-state inputs
	NO	Valid only for binary and three-state inputs

Note: User curves "Points" are adjustable in LiteEdit PC tool.



Analog inputs 1, 2, 3, 8 and 9 has separate set points for two levels alarm setting and delay for activation of alarm.

Analog input 4, 5, 6 and 7 has special „window“ protection. It is possible to adjust Low and High level with alarm setting Wm and Sd for each of level. Two delay setpoints are adjustable for Low and High level. (See Practical example below)

Window protection is necessary to adjust in Modify->Alarm properties->Direction.

Analog input alarm levels and delay adjust in Engine protect group of Setpoints.

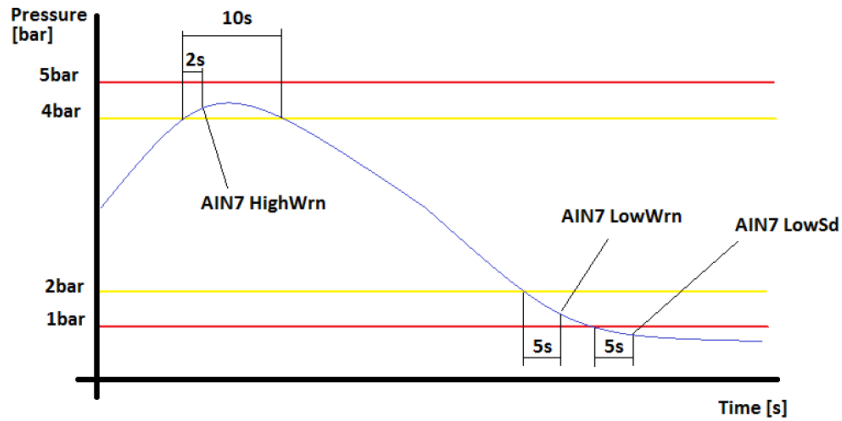
Note: In Alarm list and History is displayed only Wm and Sd for matching analog input. There isnt visible direction of protection Low or High.

Practical example of - Class C - Window protection:

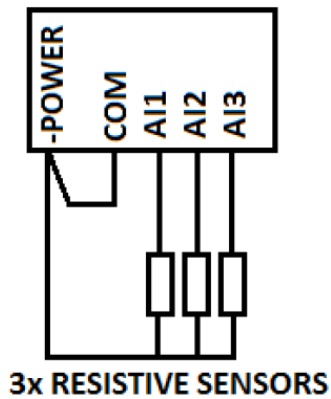
Pressure sensor is configured on the analog input 7 and is placed on the intake pipe. There are needed two level protection. Low level protection against suction from the tank without liquid, that could destroy pump. High level protection against high liquid pressure in pipe, which could destroy filters against impurity installed between tank and pump.

- ▶ AIN7 LowWm = 2 bar
- ▶ AIN7 LowSd = 1 bar
- ▶ AIN7 LowDel = 5 s
- ▶ AIN7 HighWm = 4 bar
- ▶ AIN7 HighSd = 5 bar
- ▶ AIN7 HighDel = 2 s

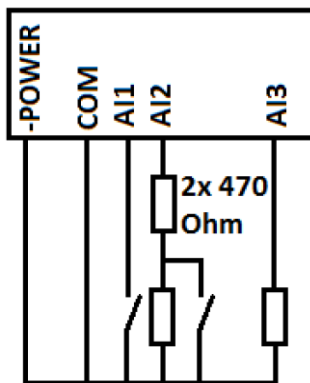
Note: Class C protection is working and LowWm, LowSd, LowDel, HiWm, HiSd, HiDel setpoints are visible only when corresponding AIN is configured in Modify->Alarm properties-> Direction-> Window prot.



5.1.3 Connection of IntelliDrive Lite analog inputs



Standard connection of three resistive sensors to analog inputs.



Mixed connection of IntelliDrive Lite analog inputs:

- ▶ AI1 – binary input
- ▶ AI2 – three state input
- ▶ AI3 – analog resistive input

Analog inputs are designed for resistive sensors with resistance in range of 0 Ω to 2.4 kΩ.

To ensure a proper function use shielded cables, especially for length over >3 m.

As binary input

Open, close state are detected, threshold level is 750 Ω.

As three state input

Open, close and failure state are detected. Threshold level is 750 Ω, failure is detected when circuit resistance is <10 Ω or > 2400 Ω.

Unused analog inputs

Configure Type = Not used

5.1.4 Current output transducers

InteliDrive Lite analog inputs are mainly designed for resistor sensors

In special case transducers to 4-20 mA output can be used for oil measuring (10.0 Bar or 6.0 Bar). Use predefined 4-20 mA / 100 or 4-20 mA / 60 sensors.

This method reduces the input resolution by less than 50%

Some types of transducers are not suitable for connection to InteliDrive Lite analog inputs because of influencing by InteliDrive Lite analog input.

Default current sensor characteristic

Use with external resistor 120 Ω.

Ω	4-20 mA / 100		0-20 mA / 100		0-20 mA / (-20 to +120 °C)
	Converted	Note 1 (*)	Note 2 (*)	Note 3 (*)	Note 4 (*)
120			0 mA	0 %	-20 °C
170	0	0 %	4 mA	20 %	8 °C
200	13				22 °C
230	25	25 %	8 mA	40 %	36 °C
280	38				50 °C
330	50	50 %	12 mA	60 %	64 °C
390	63				78 °C
460	75	75 %	16 mA	80 %	92 °C
560	88				106 °C
690	100	100 %	20 mA	100 %	120 °C

Note: (*)

Note 1 - % range for 4-20 mA input

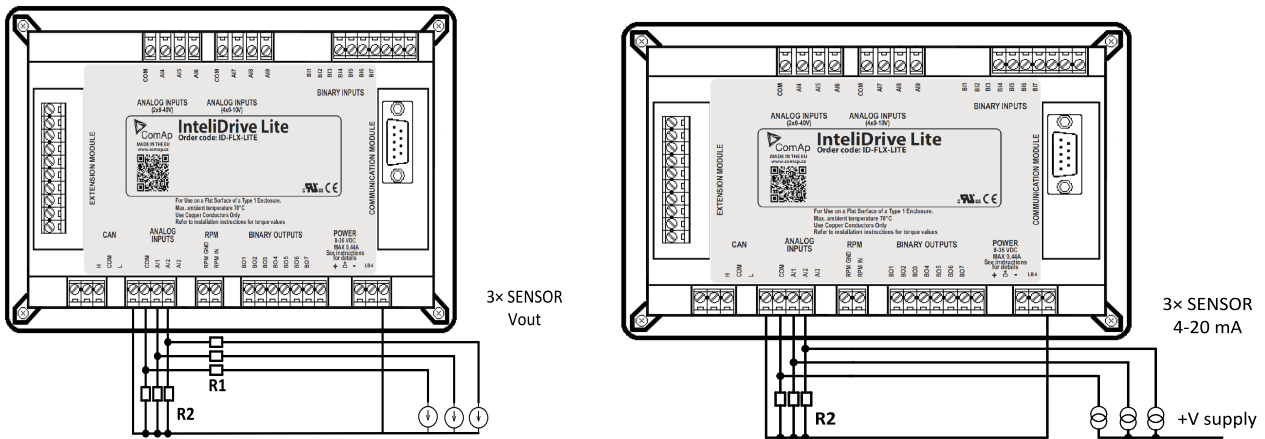
Note 2 - range 0-20 mA

Note 3 - % range for 0-20 mA input

Note 4 - characteristic 0-20 mA / (-20 to +120 °C)

5.1.5 Analog input extension measurement

On each analog input there is a possibility to connect voltage or current output sensor instead of resistive one. Recommended wiring connection for these measurements are bellow.



Recommended values

Analog input	R1	R2	Curve
0 – 10 V	150 Ω [1 %, 0.5 W]	100 Ω [1 %, 0.5 W]	AI 0-10 V.CRV
0 – 30 V	680 Ω [5 %, 2 W]	100 Ω [1 %, 0.5 W]	AI 0-30 V.CRV
0 – 65 V	1500 Ω [5 %, 3 W]	100 Ω [1 %, 0.5 W]	AI 0-65 V.CRV
4 – 20 mA	R = 160 Ω [1 %, 0.5 W]		AI 4-20 mA.CRV

IMPORTANT: Please note that external resistors disconnection, connection incorrect resistors or input voltage value during operation may cause an analog input destruction.

Example: VDO pressure sensor 0 – 6 bar with linear voltage output 0 – 10 V

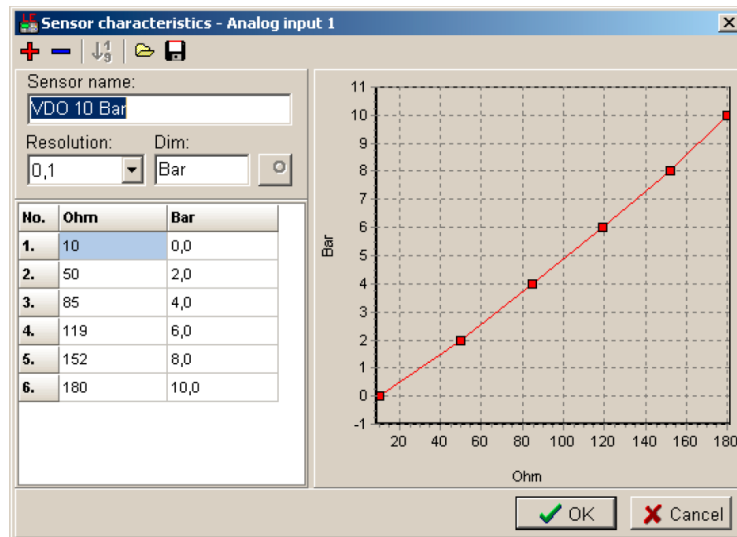
Conversion table

Vout [V]	0	1	2	3	4	5	6	7	8	9	10
P [bar]	0	0.6	1.2	1.8	2.4	3	3.6	4.2	4.8	5.4	6

Modify one of analog input in LiteEdit configuration and load curve AI 0-10 V.CRV

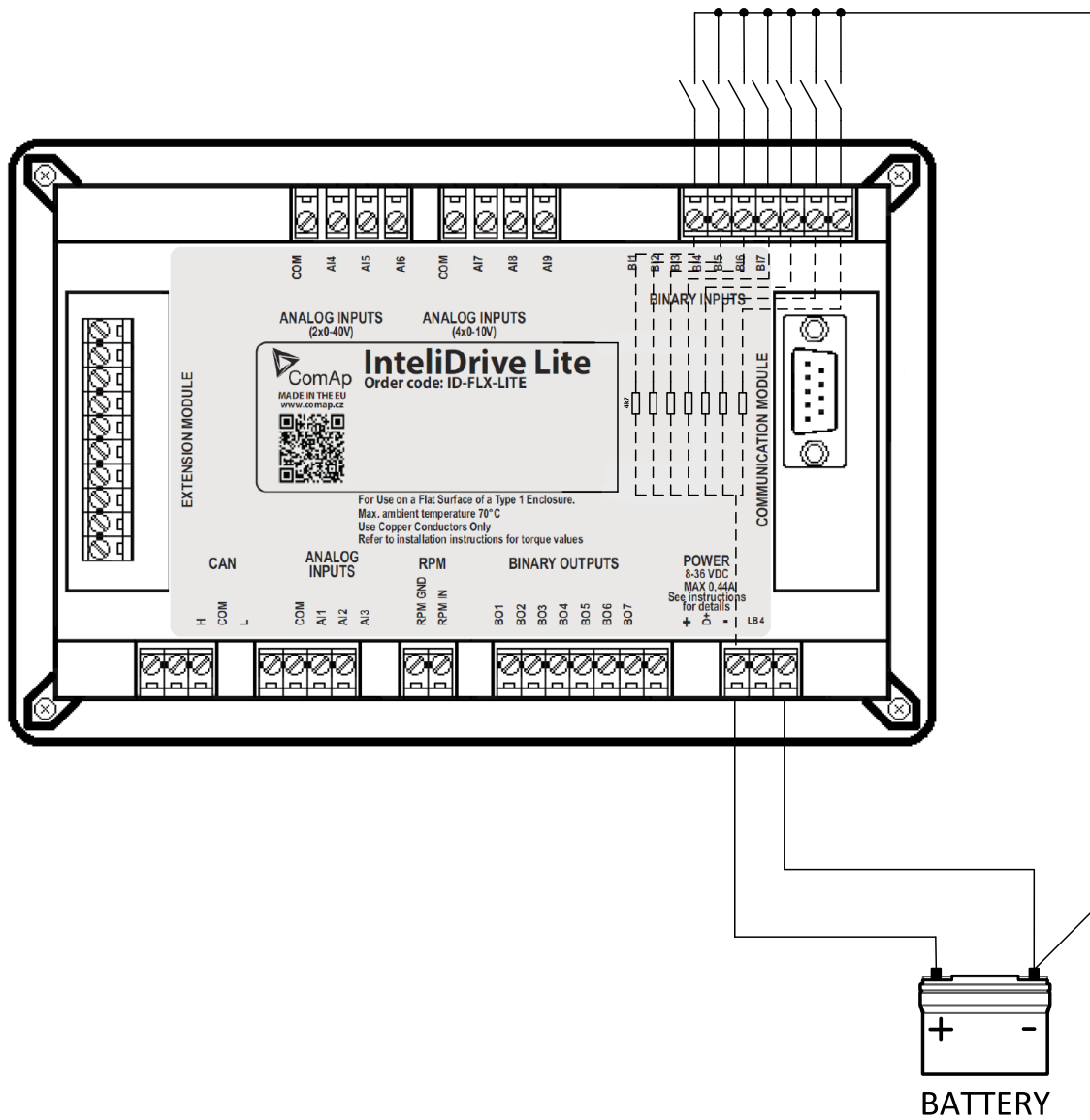
Then you can change resolution and measured value name which is default displayed at V (volts).

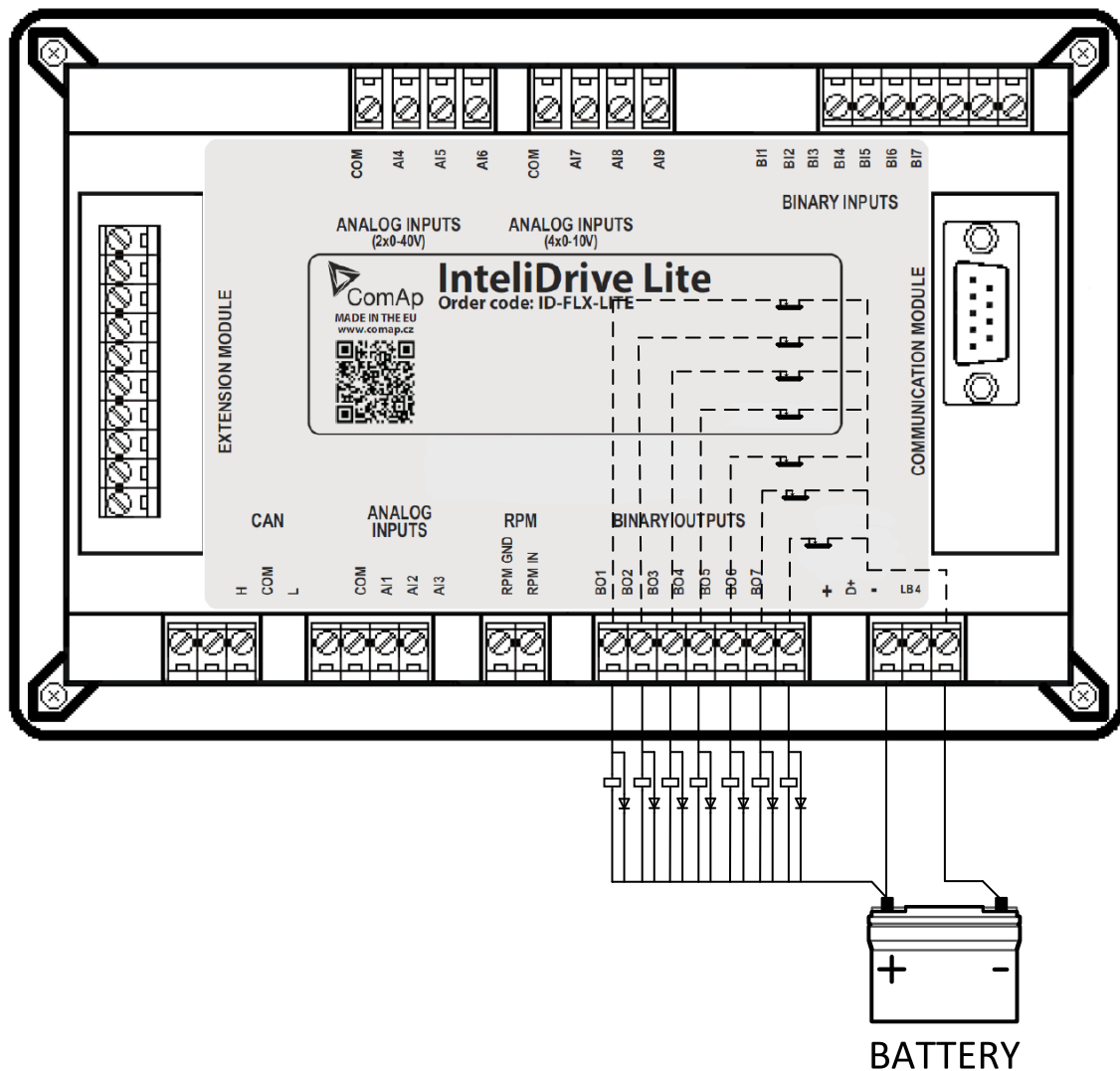
For example if you have connected pressure sensor and his output voltage is 5 V for pressure 3 bar you can change value 'V' in column "Dim:" to 'Bar' and by sensor specification adjust all corresponding values in this column. In this case you can change the value at row 6. from 5 to 3.



When you finish with adjusting the values click OK and Write to controller.

5.2 Binary inputs and outputs



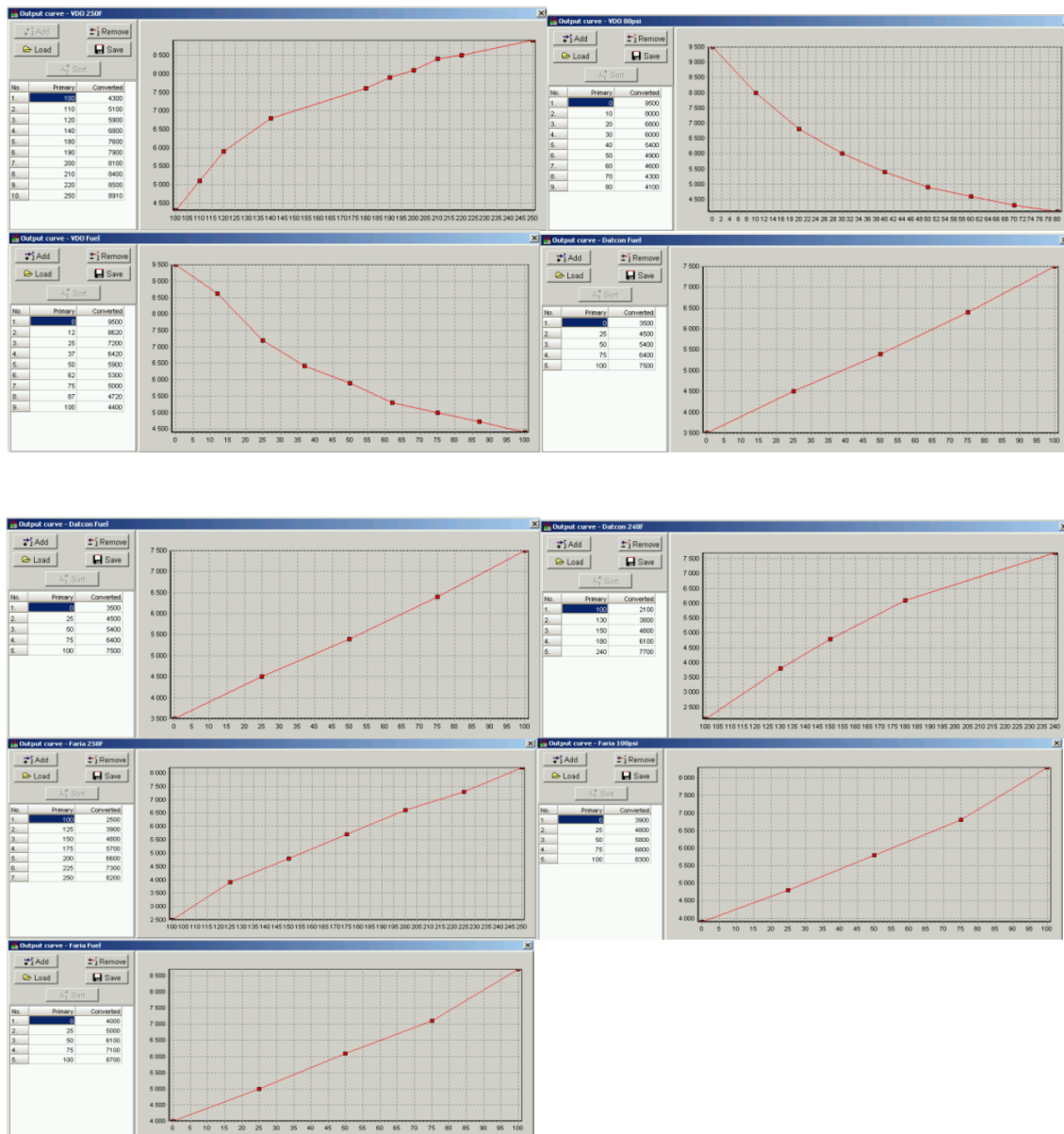


5.3 Analog outputs

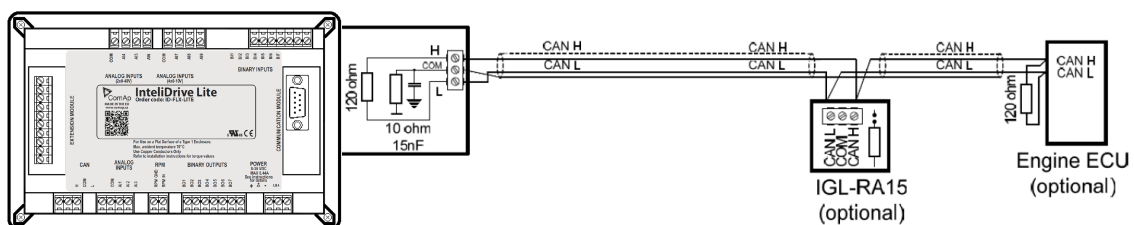
First option is extension plug-in card IL-NT AOUT8. This card provides eight Pulse-With-Modulation (PWM) outputs. These are intended to drive VDO style analog gauges. This is to provide visual indication of typically ECU values without installing additional sensors on the engine. PWM signal emulates sensor which would be typically mounted on the engine.

Second option is extension plug-in card IL-NT AIO. This card provides one current or voltage or PWM output. Any value from controller may be configured to the outputs. Use LiteEdit PC tool to configure corresponding sensor/gauge curve and value selection.

5.3.1 Default analog output curves



5.4 Remote modules - CAN bus connection



5.4.1 Connection rules


CAN bus line must be connected in series, from one unit to the next (no star, no cable stubs, no branches) both ends must be by the 120 Ω (internal or external) resistor terminated. Maximal CAN bus length is up to 200 m.

For CAN data cables details see **Technical data on page 87** – Communication interface.

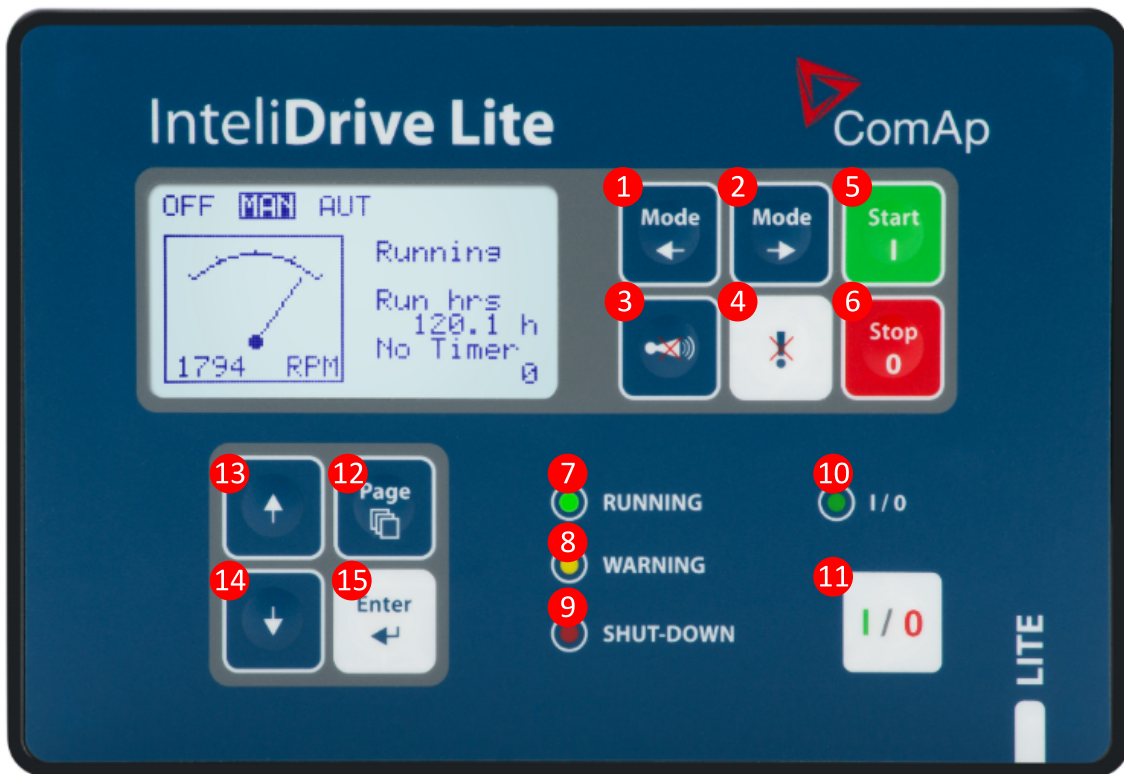
CAN cable shielding is connected to IntelliDrive Lite COM terminal.

IntelliDrive Lite contains internal fix 120 Ω resistor and must be located on the CAN bus end.









It is possible to connect only one IGL-RA15 to IntelliDrive Lite controller.




Use  button in LiteEdit Modify window to activate CAN interface.

5.5 Front panel elements



Engine control buttons

Number	Button	Description
1		MODE LEFT button. Use this button to change the mode. The button works only if the main screen with the indicator of currently selected mode is displayed. <i>Note: This button will not work if the controller mode is forced by one of binary inputs Remote OFF, Remote MAN, Remote AUT, Remote TEST.</i>
2		MODE RIGHT button. Use this button to change the mode. The button works only if the main screen with the indicator of currently selected mode is displayed. <i>Note: This button will not work if the controller mode is forced by one of binary inputs Remote OFF, Remote MAN, Remote AUT, Remote TEST.</i>
3		HORN RESET button. Use this button to deactivate the horn output without confirmation of the alarms.
4		FAULT RESET button. Use this button to acknowledge alarms and deactivate the horn output. Inactive alarms will disappear immediately and status of active alarms will be changed to "confirmed" so they will disappear as soon as their reasons dismiss.
5		START button. Works in MAN mode only. Press this button to initiate the start sequence of the engine.
6		STOP button. Works in MAN mode only. Press this button to initiate the stop sequence of the engine.
7	RUNNING LED	Engine running.
8	WARNING LED	A failure but engine keeps running.
9	SHUT-DOWN LED	Engine is stopped because of red alarm.
10	I/O LED	Status of I/O button.
11		ON/OFF button: according to the user setup, the button switches the chosed parameter (TOGGLE (PAGE 216) , NOMINAL/IDLE (PAGE 195) , CLOSE LOAD (PAGE 216) etc.)
12		PAGE button. Use this button to switch over display pages (see Display screens and pages structure on page 54 for more details).

Number	Button	Description
13		UP button. Use this button to select the set point, select the screen or increase set point value.
14		DOWN button. Use this button to select the set point, select the screen or decrease set point value.
15		ENTER button. Use this button to finish editing a setpoint or moving right in the history page.

5.6 Init screens

5.6.1 Init screen

This is a first screen after controller's start which is dedicated for information provided by customers such as contact numbers, service technician contact and customer message for end users of engine. Configuration of this screen is only done by LiteEdit PC tool.

Note: *Init (welcome) screen appears immediately after power on with ComAp default text. It is possible to modify it using LiteEdit – Configuration – Init button. There is space for 8 text lines per 21 ASCII characters each.*

5.6.2 Firmware screen

This screen contains information about controller's type, controller manufacturer ComAp, uploaded firmware, version of firmware, used application and branch. There is also information about currently configured electronic engine unit, respectively about ESF file. Details for recognition of configured electronic engine are in chapter ECU controlled engine support.

Note: *To see firmware information use panel buttons: hold ENTER and press PAGE. This procedure activates the panel LEDs test as well. The screen disappears itself after app 5 seconds.*

5.6.3 Languages screen

InteliDrive Lite controller offers configurable language support. On this screen is possible to switch between languages configured in controller. Second way, how to change language, is by binary input Lang Selection.

Note: *To switch to Language screen use panel buttons: hold ENTER and press PAGE twice. Press ENTER to leave this screen.*

5.6.4 User Interface screen

InteliDrive Lite controller enables to choose the user interface as customer prefers.

There are two choices available: USER or ENGINEER interface

USER interface is simple menu displaying just measurement, alarm and init screens.

ENGINEER interface allow changing the controller's settings, reviewing the history, measurements and alarms. This mode is default.

This screen also contains Serial and Pwd. dec. (Password decode) numbers. These numbers you can use in case of forgotten passwords.

The last line on this screen signalize DiagData number. This number is giving specific diagnostics information in case the program is from some internal reason blocked.

Note: *If the password for the controller is forgotten, then is necessary to send Serial and Pwd. dec. numbers to technical support team. They are able to renewed password for your controller.*

Note: *To switch to User interface screen use panel buttons: hold ENTER and press PAGE three times. Press ENTER to leave this screen.*

5.7 Display menus

There are 3 display menus available: MEASUREMENT and ADJUSTMENT and HISTORY in Engineer interface and only MEASUREMENT in User interface.

Each menu consists of several screens. Press repeatedly PAGE button to select requested menu.

5.7.1 Switching between User and Engineer menus

Hold ENTER and then press PAGE to activate info Firmware screen and the panel LED test. Within 5 s press PAGE to switch to Language selection screen and the second time PAGE to switch to User interface selection. Use ↑ and ↓ to select appropriate interface and press ENTER.

5.8 How to select the engine mode?

Use MODE→ or ←MODE to select requested engine operation mode (OFF – MAN – AUT).

5.9 How to view measured data?

1. Use repeatedly PAGE button to select the MEASUREMENT menu.
2. Use ↑ and ↓ to select the screen with requested data.

5.10 How to view and edit setpoints?

1. Use repeatedly PAGE button to select the ADJUSTMENT menu.
2. Use ↑ or ↓ to select requested set points group.
3. Press ENTER to confirm.
4. Use ↑ or ↓ to select requested set point.
5. Set points marked “*” are password protected.
6. Press ENTER to edit.
7. Use ↑ or ↓ to modify the set point. When ↑ or ↓ is pressed for 2 sec, auto repeat function is activated.
8. Press ENTER to confirm or PAGE to leave without change.
9. Press PAGE to leave selected set points group.

5.10.1 How to change the display contrast?

Press ENTER and ↑ or ↓ at the same time to adjust the best display contrast.

Note: Only in MEASUREMENT screen.

5.10.2 How to check software revision?

Hold ENTER and then press PAGE. This activates the panel LED test and controller's display is switched to Firmware screen. On the display you can see (for 10 seconds) IntelliDrive Lite Firmware screen containing:

1	Controller name	(see ControllerMode (page 99))
2	Firmware version	ID-FLX-Lite-x.x
3	ESF:	Version of ESF file, if ECU is configured
4	SW version:	The first is the firmware version number The second is configuration table number
5	Application:	DCU
6	Branch:	DCU

Note: Only in MEASUREMENT screen.

5.10.3 How to check the serial number and choose interface?

Hold ENTER and then three times press PAGE.

1	User interface	can choose User(block adjustment function of controller) or Engineer interface
2	Serial	8 character number
3	Pwd. dec	10 character number
4	DiagData	1 character number

Note: Only in MEASUREMENT screen.

5.10.4 How to change language?

Hold ENTER and then two times press PAGE to get to Languages selection screen. Use ↑ or ↓ to select desired language and press ENTER to confirm selection.

5.11 How to find active alarms?

Active alarm list is the last screen in the MEASUREMENT menu.

Select MEASUREMENT menu. Press ↑ you will see the list of all active alarms with the number of alarms at the top-right corner three state alarms are introduced:

Example	Description
*Wm Water temp	Active not accepted alarm
Wm water temp	Active accepted alarm
*Wm Water temp	Inactive not accepted alarm
	Inactive accepted alarm

Press FAULT RESET accepts all alarms. Non-active alarms immediately disappear from the list. Active alarm list appears on the screen when a new alarm comes up and Main MEASUREMENT screen is active.

Note: Alarm list does not activate when you are reviewing the values or setpoints.

The second alarm list for ECU alarms is also available. It is displayed one screen above the standard alarm list on the controller display or under the standard alarm list in Control window of LiteEdit. If an alarm appears in this alarm list, it is signalized in the standard alarm list and by exclamation mark on the main measure screen.

Control from the front panel	
↑↓	One screen up/down
Enter	Cursor move within the ECU alarm list
Enter + Fault reset	ECU fault code reset

5.12 How to list History records?

1. Use repeatedly PAGE button to select the History menu.
2. Use ↑ or ↓ to select requested History line.
3. Press ENTER to go-on line to right.
4. Use repeatedly PAGE button to go back to Measurement screen.

5.13 MEASUREMENT screens description

5.13.1 Main measure screen



①	Operation mode of the engine
②	Indication: “L” = Access lock, “!” = active Alarm
③	Status of the engine
④	Run hrs - events counting Running hours of the engine
⑤	Timer - events counting time (e.g. prestart, cooling, etc.)
⑥	Engine RPM

5.13.2 IntelliDrive Lite Analog inputs screens

First screen

Oil pressure	(AI1 bargraph with protection limits indication)
Water temperature	(AI2 bargraph with protection limits indication)
Fuel level	(AI3 bargraph with protection limits indication)
Battery voltage	(Power supply bargraph with protection limits indication)

Second screen

AIN4	(Displayed only if is configured)
AIN5	(Displayed only if is configured)
AIN6	(Displayed only if is configured)

Third screen

AIN7	(Displayed only if is configured)
AIN8	(Displayed only if is configured)
AIN9	(Displayed only if is configured)

5.13.3 IL-NT-AIO Analog inputs screen

AI1	(AI1 bargraph with protection limits indication, displayed only if is configured)
AI2	(AI2 bargraph with protection limits indication, displayed only if is configured)
AI3	(AI3 bargraph with protection limits indication, displayed only if is configured)
AI4	(AI4 bargraph with protection limits indication, displayed only if is configured)

Note: This screen is shown/hidden depending on whether the IL-NT AIO is configured or not.
Analog output AO1 is not displayed on any screen!

5.13.4 IntelliDrive Lite Binary inputs

BI1 to BI7

5.13.5 IntelliDrive Lite Binary outputs

BO1 to BO7

5.13.6 IL-NT-BIO8 Binary inputs screen

IN: BIO8 BI1 Alarm	
IN: BIO8 BI2 Alarm	
IN: BIO8 BI3 Alarm	
IN: BIO8 BI4 Alarm	
IN: BIO8 BI5 Alarm	
IN: BIO8 BI6 Alarm	
IN: BIO8 BI7 Alarm	
IN: BIO8 BI8 Alarm	this line is displayed on the following screen

Note: These screens are shown/hidden depending on whether the IL-NT BIO8 is configured or not.

5.13.7 IL-NT-IO1 Binary inputs screen

IN: BIO8 BI1 Alarm
IN: BIO8 BI2 Alarm
IN: BIO8 BI3 Alarm
IN: BIO8 BI4 Alarm

Note: This screen is shown/hidden depending on whether the IL-NT-IO1 is configured or not.
Analog outputs are not displayed on any screen!

5.13.8 ECU State

ECU State	
ECU YellowLamp	
ECU RedLamp	
WaitToStart	
SpeedReq Abs	Required RPM of the engine
SpeedReq Rel	%

Note: This screen is shown/hidden depending on whether the ECU is configured or not.

5.13.9 ECU Values

It depends on the ESF file which is configured. See practical example of the screen below for Caterpillar J1939 2.1.

Example:

Fuel rate	L/h or gph
CoolantTemp	°C or °F
IntakeTemp	°C or °F
Oil pressure	Bar or psi
Boost pressure	Bar or psi
Load	% (Percentual load at current speed)

Note: This screen is shown/hidden depending on whether the ECU is configured or not.

5.13.10 Statistic

Number of starts

E-Stop	Number of engine Emergency stops (without ShutDowns)
ShutDown	Number of engine ShutDown stops (without Emergency stops)
SpeedReq Abs	Required RPM of the engine
LoadLimitAout	Output of Load limit loop – see Group: Load limit on page 138
RPM-BI3	RPM detected and counted on the BI3 input

Note: Running time is displayed on the Main screen of measurements and is measured in complete minutes, displayed in complete hours. Values are stored in nonvolatile memory.

5.13.11 ECU AlarmList

Diagnostic messages are read from ECU and displayed in this second alarm list. For Standard J1939 engines SPN (Suspect Parameter Number), FMI (Failure Mode Identifier) and OC (Occurrence Counter) are shown together with verbal description if available.

Following image shows displaying of ECU alarms in the second alarm list. The additional information for the row selected by cursor is on the last row (SPN, OC and FMI codes).

If the verbal description of alarm is not available, the SPN (decimal and hexadecimal) is displayed.

EngOilPress	WRN
BoostPress	FLS
EngOilTemp	FLS
629 (275h)	FLS
Controller#1	


EngCoolTemp	WRN
SPN:110	OC:7 FMI:3

Note: For FMI = 0 and 1, WRN is displayed. For other FMI codes, FLS is displayed.

5.13.12 Alarm list

Alarm list displays active or inactive alarms occurred on IntelliDrive Lite unit. IntelliDrive Lite controller automatically switches to the Alarm list screen when any new Alarm appears, but from Main measure screen only, **see Alarm management on page 72**.


5.14 Display screens and pages structure

1	OFF MAN AUT	2	1 Operation mode of the engine
		3	2 Indication "L" = Access lock, "!" = Active alarm
	Not ready		3 Status of the engine
	DPF Soot 0 %	4	4 Timers / AIN 6+7 / ATT (DPF1 Soot, DEF Level)
	No Level 0 %	5	5 Engine RPM
5	0 RPM		

Oil Pressure#####Bar	AIN4	0U10
Engine Temp ##### °C	AIN5	0U11
Fuel level ##### %	AIN6	0U12
Ubat 27.4 U		
AIN7 0U13	BIN	0000000
AIN8 0U14	Rem start/stop	0
AIN9 0U15	Access lock	0
	Emergency stop	0
	Remote OFF	0
	Sprinkler	0
	Rem	0
	Not used	0

BOUT 0001000	SpeedReq Abs 800RPM
Starter 0	RPM-BI3 0RPM
Fuel solenoid 0	LoadLimitAout 1000
Prestart 0	
Alarm I	
Horn 0	
Not used 0	
Not used 0	

Run hrs 0.0 h	GSM SignalLvl 51%
Num-starts 37	GSM ErrorRate 0
DayCons 0 L	Modem Status: Ready
TripCons 0 L	GSM DiasCode: 0
	AirGate ID: 969b0ad6
	AirGate Dias: 5
	Visible only if there is a connected plug-in module which use these values (GSM, GPRS, etc.)

<p>Aftertreatment</p>  <p>Visible only if there is a connected TF4 engine</p>	<p>ECU AlarmList</p> <pre>>*ThrottlePos *EngOil Press *000589(00240h) *CrankcasePress *Fuel Temp</pre> <p>FC 51 OC 5 FMI 1</p> <p>Visible only if there is a configured ECU</p>
------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

```
AlarmList
*ThrottlePos
*Wrn Engine Temp
*Wrn Fuel Level
*Sd Fuel Level
*Wrn Batt Volt
```

5.15 Functions

5.15.1 Engine operation states

Engine state	Meaning
Init	Auto test during controller power on
Not ready	Engine is not ready to start
Prestart	Prestart time (page 114) sequence in process, Prestart output is closed
Cranking	Engine is cranking
Pause	Pause between start attempts
Starting	Starting speed is reached and the Idle time (page 118) is running
Running	Engine is running
Stop	Stop
Shutdown	Shut-down alarm activated
Ready	Engine is ready to run
Cooling	Engine is cooling before stop
EmergMan	Emergency Manual engine operation
AfterCool	Engine after cooling - Cooling Pump output is closed

5.15.2 OFF mode

No start of the engine is possible. Outputs STARTER and FUEL SOLENOID are not energized. No reaction if START, STOP buttons are pressed.

5.15.3 MAN mode

START – starts the engine.

STOP – stops the engine.

Note: *The engine can run without load unlimited time.*

The controller does not automatically stop the running engine in MAN mode.

The controller does not start the engine when binary input REM START/STOP is closed.

5.15.4 Start-stop sequence (simplified)

MODE = MAN (Engine start/stop request is given by pressing buttons START and STOP)

MODE = AUT (Engine start/stop request is given by binary input REM START/STOP)

State	Condition of the transition	Action	Next state
Ready	Start request	PRESTART on Prestart time counter started	Prestart
	RPM >2 or Oil pressure detected or D+ is active		Stop (Stop fail)
	OFF mode selected or Shut down alarm active		Not Ready

State	Condition of the transition	Action	Next state
Not Ready	RPM < 2, Oil pressure not detected, D+ not Active, no shutdown alarm active, other than OFF mode selected		Ready
Prestart ¹	Prestart time elapsed	STARTER on FUEL SOLENOID on ² MaxCrank time counter started	Cranking
Cranking ¹	RPM >Start RPM AND BI: Nominal/Idle is active	STARTER off PRESTART off	Starting
	RPM >Start RPM AND BI: Nominal/Idle is not active	STARTER off PRESTART off READY TO LOAD on	Running
	D+ input activated for 1 s or oil pressure detected	STARTER off PRESTART off	Cranking
	MaxCrank time elapsed, 1st attempt	STARTER off FUEL SOLENOID off STOP SOLENOID on CrankFail pause timer started	Crank pause
	MaxCrank time elapsed, last attempt	STARTER off PRESTART off	Shutdown (Start fail)
Crank pause ¹	CrankFail pause elapsed	STARTER on FUEL SOLENOID on ² STOP SOLENOID off MaxCrank time counter started	Cranking
Starting ¹	NOMINAL/IDLE (PAGE 195) is active	FUEL SOLENOID on ² STOP SOLENOID off READY TO LOAD off	Starting
	RPM = 0 or any other shutdown condition	FUEL SOLENOID off STOP SOLENOID on	Shutdown
	Stop time elapsed or Engine stopped + 10 s elapsed	FUEL SOLENOID off STOP SOLENOID on	Shutdown (Start fail)
Running	Stop request	READY TO LOAD off Cooling time timer started	Cooling

State	Condition of the transition	Action	Next state
	NOMINAL/IDLE (PAGE 195) is active	FUEL SOLENOID on STOP SOLENOID off READY TO LOAD off	Running
	RPM = 0 or any other shutdown condition	FUEL SOLENOID off STOP SOLENOID on READY TO LOAD off	Shutdown
Cooling	Cooling time elapsed	FUEL SOLENOID off STOP SOLENOID on	Stop
	RPM = 0 or any other shutdown condition	FUEL SOLENOID off STOP SOLENOID on	Shutdown
	Start request	READY TO LOAD on	Running
Stop	RPM < 2, Oil pressure not detected, D+ not active		Ready
	STOP time setpoint elapsed + 10 s elapsed		Stop (Stop fail)

Note:

¹ The start-up sequence can be interrupted in any time by coming stop request

² Fuel solenoid is switched on with advance of 1 s fixed before starter motor is switched on.

Note: Threshold level for D+ input is 80% supply voltage; activation delay is 1 s (to override short firings during cranking – for example in cold conditions).

Speed request:

Engine speed is constant or set manually using Engine params setpoints and Binary inputs.

5.15.5 AUT mode

The controller does not respond to START, STOP buttons. Engine start/stop request is given by binary input REM START/STOP.

Engine speed request is sourced from PI loop (see below function 3) in AUT mode.

PI loop and Hysteresis comparator functions can be used both for Engine Load Limitation or any other control function.

Speed request:

Engine speed is adjusted automatically by internal PID loops (when active) - Regulator setpoints group.

5.15.6 Engine without pickup operation

The RPM pickup input is ignored when **Gear teeth (page 94) = 0**. The engine running state is then detected based on **Starting POil (page 114)** or **D+ function (page 123) = ENABLED**.

Starting POil (page 114) signal can be analog or binary. Even the binary signal is to be connected to AIN1 input. In LiteEdit, window Modify, input Oil Pressure, check off the option Binary. The setpoint **Starting POil (page 114)** set to 1.

5.15.7 Engine timer

MAN mode

Set the **Running timer (page 130)**. Start engine in MAN mode by START button. Engine stops itself after Running Timer is over. The STOP button cancels timer (forces cooling), the second STOP cancels cooling (forces engine stop). Engine stays running when Running Timer = 0.

AUT mode

Engine starts and runs all the time when the **REM START/STOP (PAGE 192)** is closed. Running Timer is activated after Rem start/stop is opened. To stop the engine the Rem start/stop has to be opened or controller switched to MAN. Panel STOP button has no effect when Rem start/stop is closed in AUT, but skip the timer and switch to cooling when Rem start/stop is opened.

Note: The controller also includes two identical timers with function for auto start and stop with different condition. Use Date/Time setpoints group. For explanation see **Setpoints on page 91**.

	MAN mode		AUT mode	
	RunTimer = 0 = disabled	RunTimer > 0 = enabled	RunTimer = 0 = disabled	RunTimer > 0 = enabled
Rem s/s = ON	No function		Start and Run unlimited time	
Rem s/s = OFF			Cooling	Cooling after RunTimer is over
START	Engine runs unlimited time until STOP	Engine start-runs Run time and then CoolingStop	No function	When Rem s/s = OFF only: Engine start-runs Run.time and then Cooling-Stop
STOP	Cooling		No function when Rem s/s = 1 Cancels timer when Rem s/s = 0	
2nd STOP	Stop			

5.15.8 Protections

The controller protects the engine and the driven machine as well.

When an alarm occurs, these actions are taken: on the controller front side, the yellow or red LED starts to blink. The LBO Alarm is activated, which allows turning on another distant alarm light, horn or other device. Finally, the event of alarm is written into history.

The majority of possible faults are watched in three levels.

The alarm Warning (Wm, yellow color) signals that the watched value approaches the dangerous level.

The alarm ShutDown (Sd, red color). The main protected parameters are the minimal oil pressure, minimal and maximal speed, maximal cooling water temperature. The information about these analog values is brought into the controller through analog inputs (AIN) or, in the case of an electronic engine (engine equipped by ECU), by CAN bus.

The alarm CoolDown Cd, red color). Its configurable type of alarm, where isn't necessary immediately to stop the engine. E.g. because of low fuel level can be the engine switched by degrees over cooling time and idle speed.

Apart from here above mentioned "ready to wear" basic protections, the user can configure each analog or binary input as a protection. The configuration of binary inputs is done in LiteEdit, in the window Modify.

Note: Class B protection: for binary inputs configured as a protection, the individual delay can be set by the means of setpoints BIN1 Prot Del, BIN2 Prot Del, etc.

The configuration of the analog inputs can be done by a similar way, in LiteEdit, in the window Modify and in the group of setpoints Engine protect, where is possible to set the alarm levels by means of setpoints.

Note: Class C protection: the analog inputs AIN4, AIN5, AIN6 and AIN7 behave either "normally" or according to the class C definition according to the SP AINx Eval.

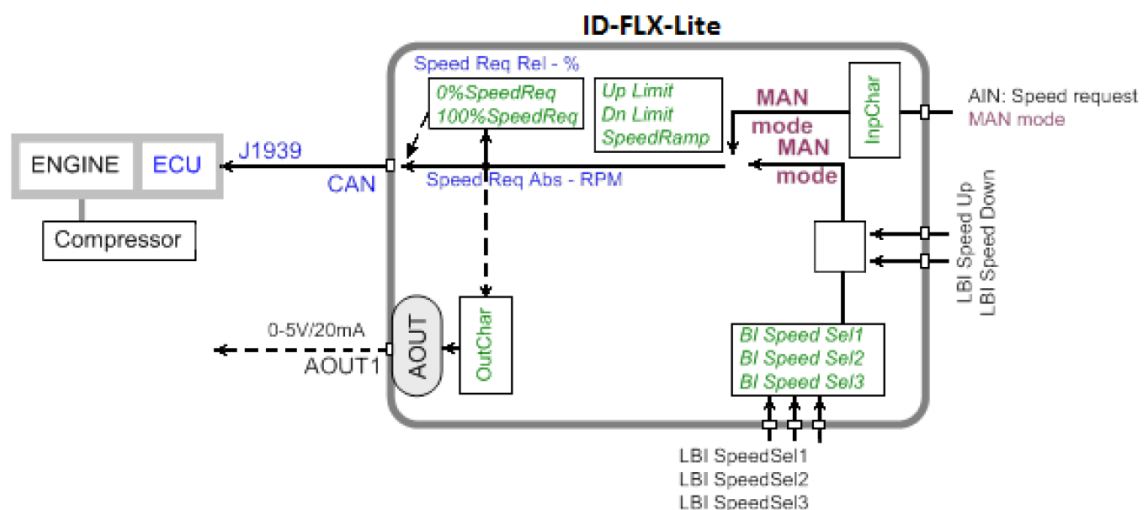
IMPORTANT: The LBI Prot Test blocks temporarily all the protections in order to perform tests etc.

Note: For other details about the protections, see the paragraph Setpoints, Engine protect.

5.15.9 Engine RPM control in MAN mode

There are following options to setup and change the engine speed:

- ▶ Start to Nominal RPM and run at constant speed.
- ▶ Start to Idle speed and Automatically (Idle time) or manually by Binary input: Nominal/Idle
- ▶ Ramp to Nominal (or preset) RPM.
- ▶ Switch the RPM in three steps by Binary inputs BI Speed Sel1, 2, 3.
- ▶ Ramp engine RPM Up/Down by Binary inputs BI Speed Up and Speed Down.
- ▶ Control engine RPM by Analog input - e.g. by potentiometer.



Engine RPM Idle - Nominal switching

NOMINAL/IDLE (PAGE 195) switches RPM to Idle speed (page 118) when closed (in MAN mode only). Opened input ramps to ECU SpeedAdj (page 124). No RPM control is active in engine Idle state.

Engine RPM two/three levels switching

Continuing example above closed Speed Sel1 (page 196), Speed Sel2 (page 196), Speed Sel3 (page 196) ramps the Engine RPM to the selected setpoint level. ... i.e. switched/ramped to another three levels.

Note: Necessary condition: LAI SpdRequest (page 132) = OFF and controller MAN mode.

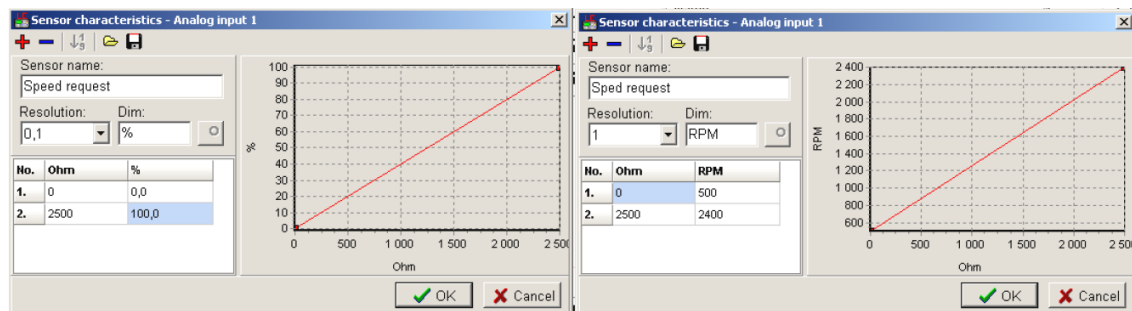
Engine RPM by Up/Down buttons settings

RPM adjusted in examples above can be changed by SPEED UP (PAGE 195) / SPEED DOWN (PAGE 195) when the RetToSpeedAdj (page 124) = DISABLED.

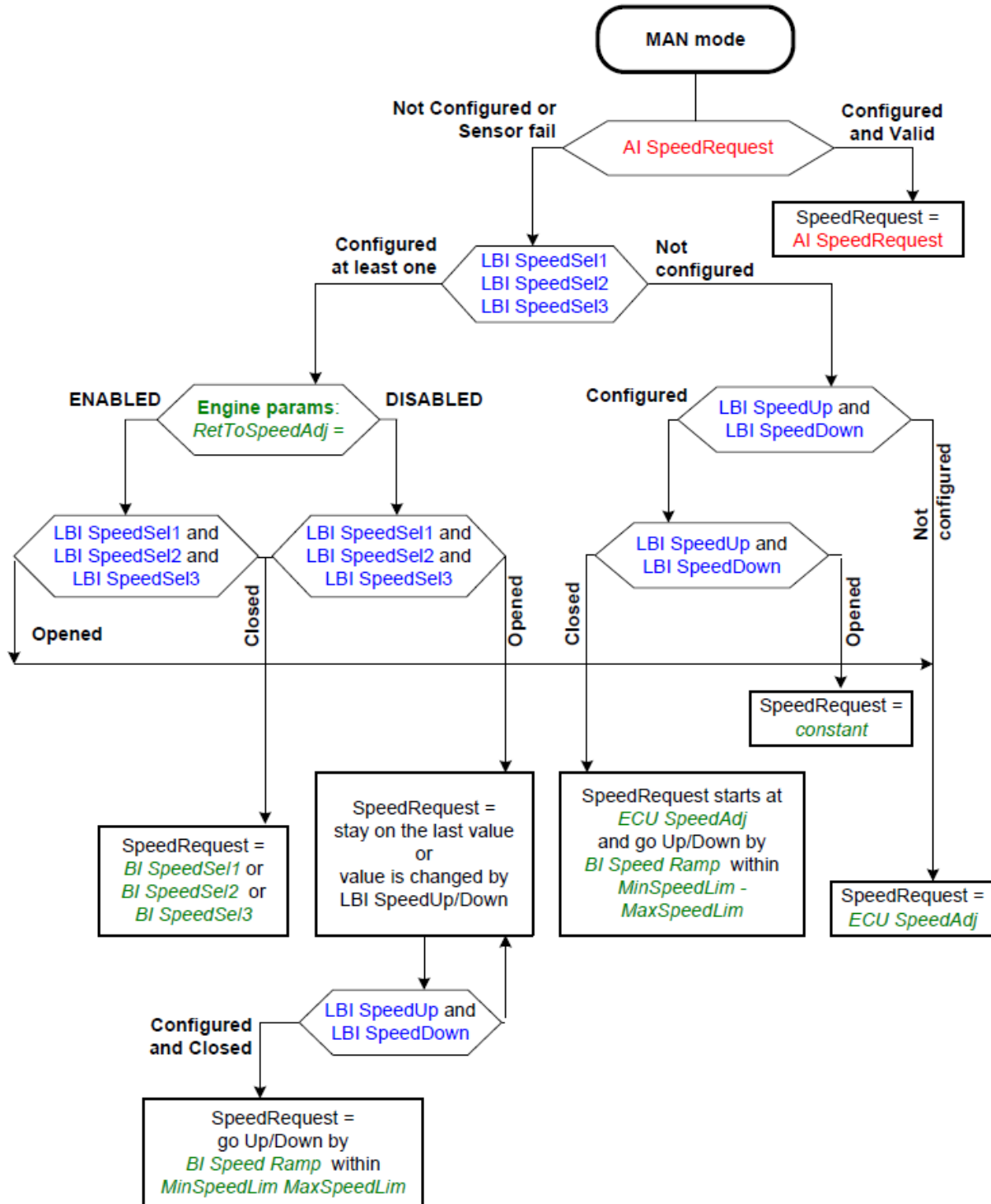
Note: Necessary condition: LAI SpdRequest (page 132) = OFF and controller MAN mode.

Engine RPM continuous change (using potentiometer)

Adjust LAI SpdRequest (page 132) = AI1-9 ... to corresponding controller or extension module analog input. Configure this Analog input - sensor characteristic in RPM or Percentage (expected potentiometer resistance 2.5 kΩ in example below). Speed Ramp (page 127) is active.



Speed request chart



5.15.10 AUT mode: Engine load limitation – overview

Functions below can reduce the engine load when is over adjusted limit.

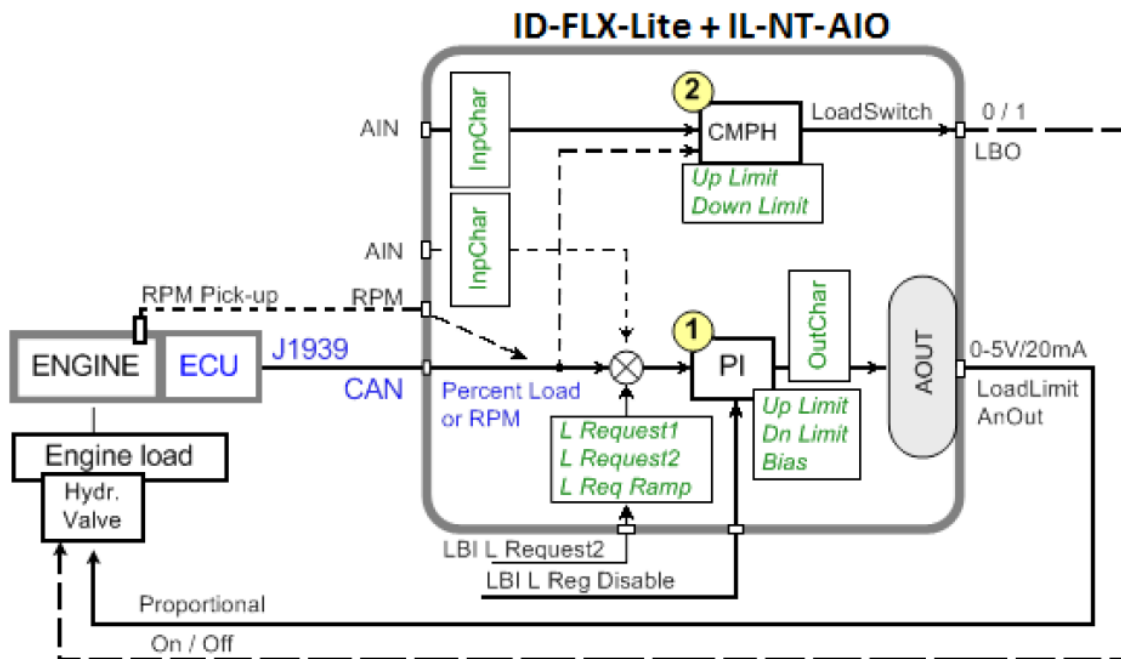
Two functions 1st PI loop and 2nd Comparator with Hysteresis (CMPH) are available and these functions are described below. The function setup is done by corresponding setpoints in Load limit group. This group has one PI loop and one CMPH. Both functions can use different inputs from ECU (Engine Load or RPM) or from pickup (RPM) or value from Analog input.

PI loop and Hysteresis comparator functions can be used for Engine Load Limitation or for any other control function.

IMPORTANT: Regulator is working permanently in AUT mode.

In table below see different operation conditions.

Condition	Analog output LoadLimitAnOut	Binary output Load switch
OFF mode	=0	=0
MAN mode	In operation	In operation
AUT mode	In operation	In operation
Running	In operation	In operation
Stop = Not Running	In operation	In operation
Sd protection	Load limit: Bias	
LBI L Reg Disable = 1	Load limit: Bias	



Functions 1 and 2

LBI	Active input
LoadRequest2	Switch to Load Request 2
LoadRegDisable	Set PI Regulator output to constant P Bias Regulator is working when this LBI is not configured.

LBO	Function
LoadSwitch	Load Comparator output (Up/Down Limit)

LAO	Function
LoadLimitAOut	Analog output of Load Limitation PI control loop.

Functions 1 and 2 setpoints

Load limit	Values
Load Input	ECU: RPM, Load, CU: AI1-AI9, AIO: AI1-AI4
Load Bias	0 - 10000 [-]
LoadRequest 1	±10000 [-]
LoadRequest 2	±10000 [-]
LoadReq Ramp	1 - 10000 [-]
LoadUpLimit	0 - 10000 [-]
LoadDnLimit	0 - 10000 [-]
Load Gain	0.0 ±200.0%
Load Integral	0.0 % - 100.0 %
Load CMP Input	ECU: RPM, Load, CU: AI1-AI9, AIO: AI1-AI4
Load CMP Off	±10000 [-]
Load CMP On	±10000 [-]

Note: For more information see *Setpoints on page 91*.

Functions 1 and 2 examples

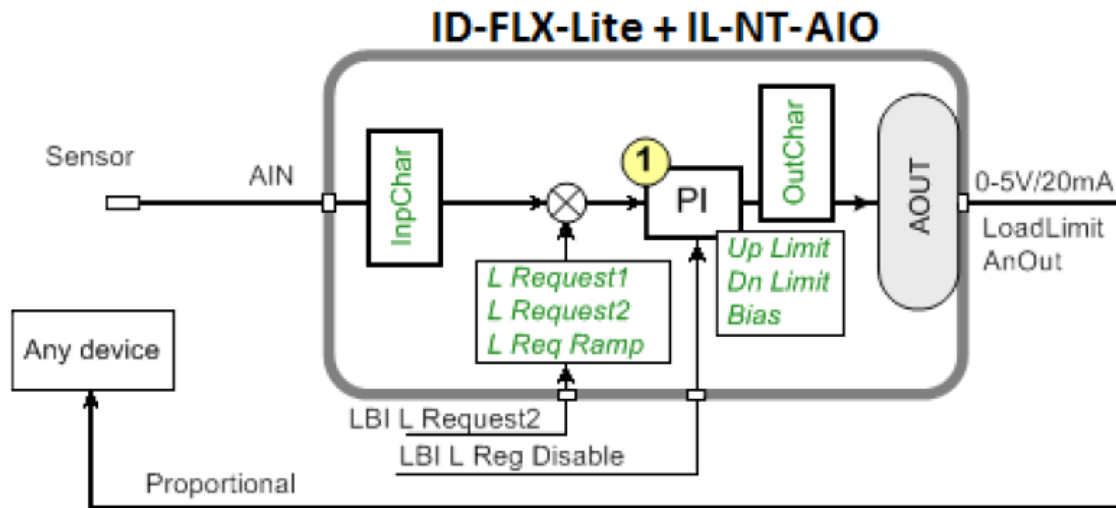
- ▶ General PI control loop
- ▶ Engine Load limitation with analog output
- ▶ General comparator
- ▶ Engine Load limitation with On/Off output
- ▶ Speed switch

General PI control loop

Purpose: PI control of any value.

Description: PI detects the difference between actual and requested value and changes the output to keep the controlled value on the limit. Can be used PI in function 1 or 3

Function requires plug-in module with Analog output.



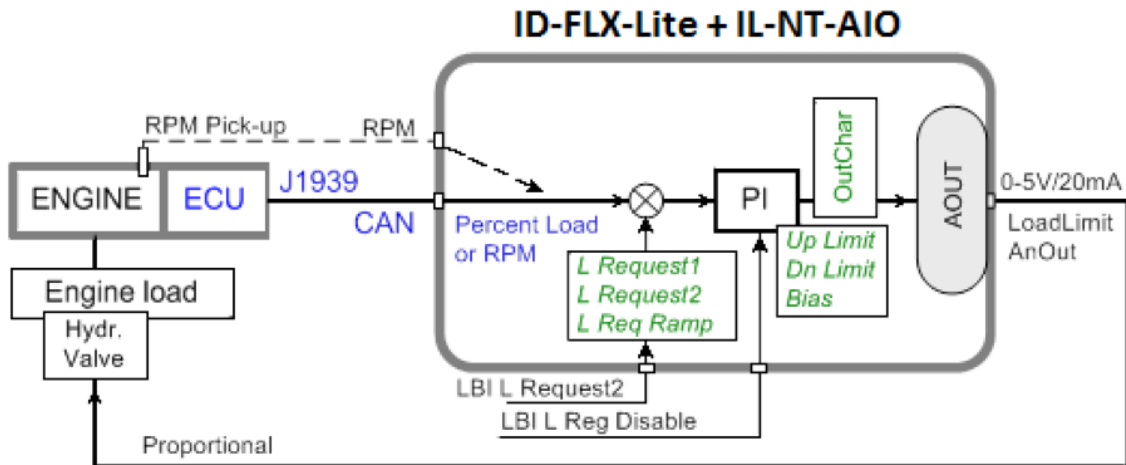
Input	Analog input	CU: AI1-AI9 AIO: AI1-AI4	
	Binary input	LoadRequest2	(optional)
	Binary input	LoadRegDisable	(optional)
	Binary input	RegRequest2	(optional)
Output	Analog output	Load Limit	(plug-in module)
	Analog output	ByRPMCtrlAout	
Setpoints	Load limit	Load Input = Load	
		Load Bias	
Setpoints	Regulator	Load Request 1	
		Load Request 2	
Setpoints	Regulator	Load ReqRamp	
		Load UpLimit	
Setpoints	Regulator	Load DownLimit	
		Load Gain	
Setpoints	Regulator	Load Integral	
		Reg Input	
Setpoints	Regulator	Reg Bias	
		Request	
Setpoints	Regulator	Request 2	
		Reg Gain	
Setpoints	Regulator	Reg Integral	

Engine load limitation with analog output

Purpose: Protect the engine against overload by reducing the load.

Description: The engine load (e.g. feeder speed) is reduced when actual “Percentual load” (coming from ECU) is over the **LoadRequest 1 (page 139)** (or **Load request 2 (page 139)**) setpoint. Load can be continuously

reduced by Analog output or switched between two levels by Binary output to keep the Engine load on or below the limit.

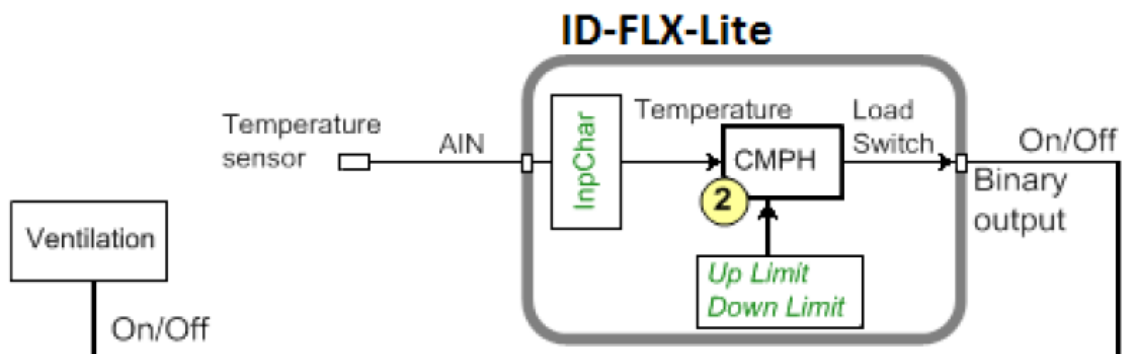


Input	Binary input Binary input	L Request 2 Reg Disable	(optional)
Output	Analog output	Load LimitAnOut Note: LoadLimitAnOut range = 0 - 10000	(plug-in module)
Setpoints	Load limit	Load Input = Load Load Bias Load Request Load Request 2 Load ReqRamp Load UpLimit Load DownLimit Load Gain Load Integral	

General comparator

Purpose: Switch on/off some device depends on analog value - e.g. temperature.

Description: The function activates/deactivates some device based e.g. on temperature.

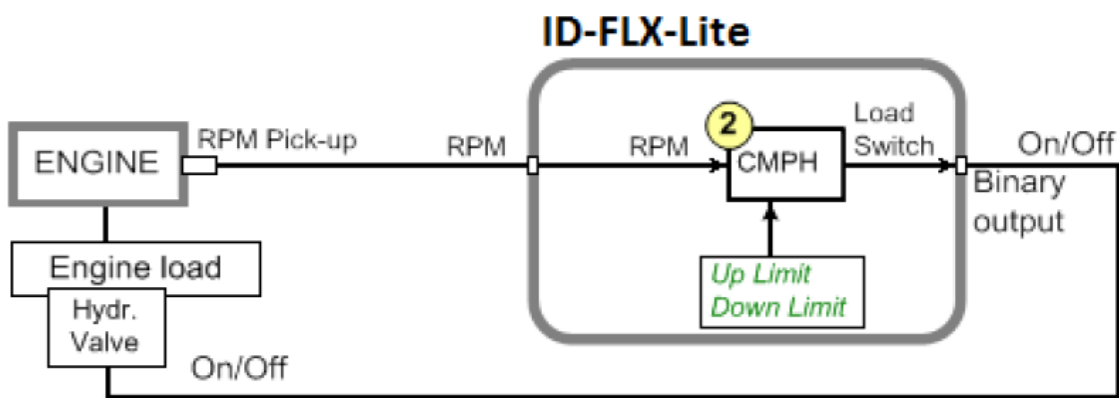


Input	Analog input	CU: AI1-AI9 AIO: AI1-AI4
Binary output	Load Switch	
Setpoints	Load limit	Load CMP Input = AI1 Load CMP On = 90 Load CMP Off = 80

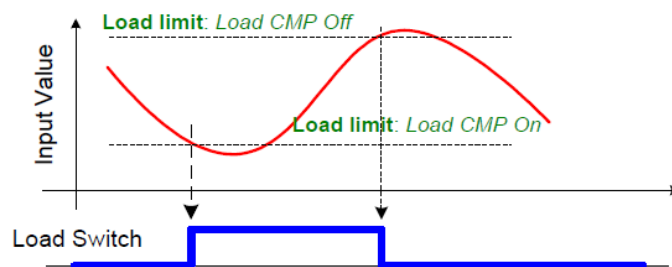
Engine load limitation with On/Off output

Purpose: Protect the engine against overload by reducing (switching On/Off) the load.

Description: CMPH (Comparator with Hysteresis) detect the RPM decrease below the Down limit, activates the Binary output Load switch that reduces (slow down feeder) the load. There are expected corresponding droop characteristics on the engine.



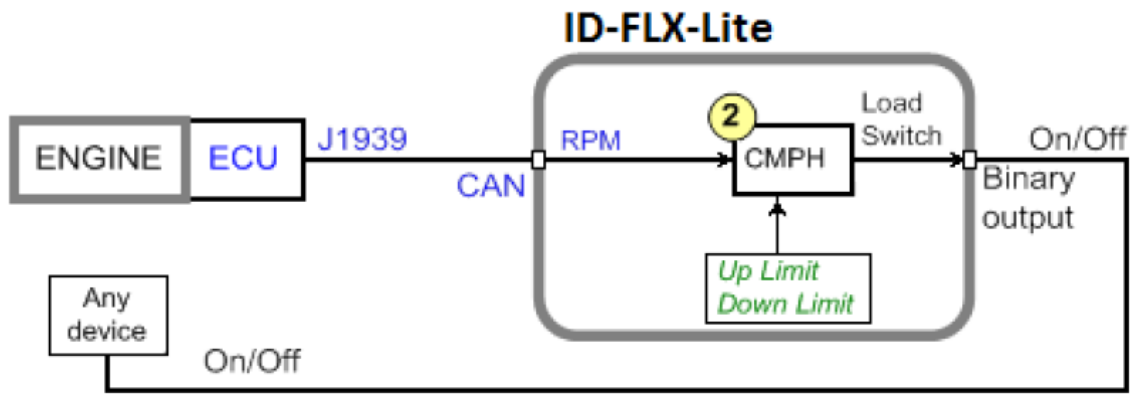
Input	RPM from pickup (or ECU)	
Binary output	Load Switch	
Setpoints	Load limit	Load CMP Input = RPM Load CMP On = e.g. 2000 Load CMP Off = e.g. 2200



Speed switch

Purpose: Switch on/off some device depends on RPM level.

Description: Depends on setpoint settings the CMPH (Comparator with Hysteresis) activates/deactivates the Binary output Load switch that switch off some device when RPM is below adjusted limit.



Input	Analog input	
Binary output	Load Switch	
Setpoints	Load limit	Load CMP Input = Actual Load Load CMP On = 2000 Load CMP Off = 2200

5.15.11 AUT mode: Engine regulation by RPM control – overview

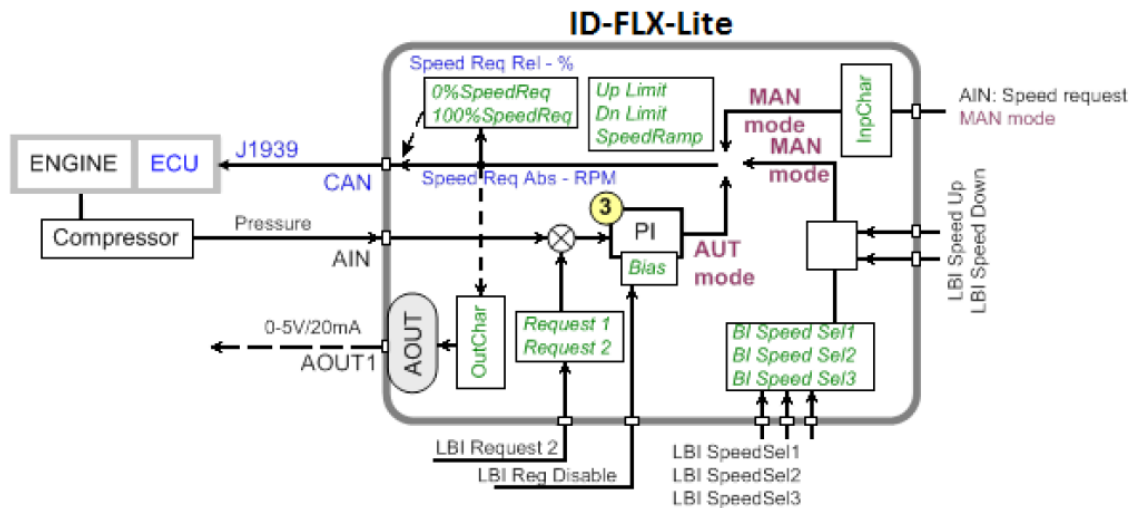
Functions below can automatically change the engine RPM to keep value measured on controller (plug-in module) Analog input (e.g. Pressure) on adjusted level.

Functions 3 = PI loop and 4 = Comparator with Hysteresis (CMPH) are available. The function setup is done by corresponding setpoints in Regulator group. This group has one PI loop and one CMPH.

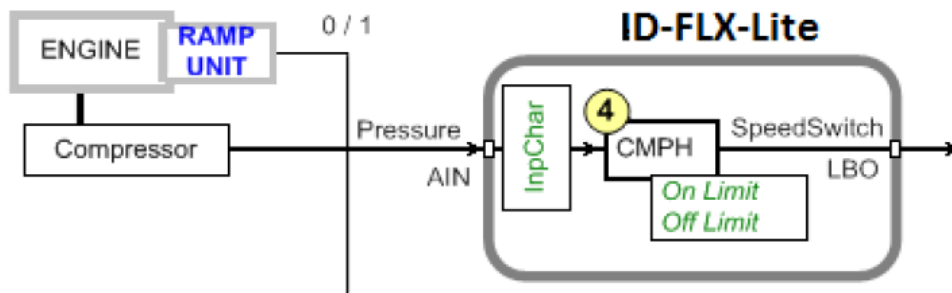
The PI function output is Speed request transmitted via J1939 or Analog output. Both functions can use controller or plug-in IL-NT-AIO module Analog inputs.

Note: In Regulator is input only from analog inputs or from RPM-BI3.

Condition	Speed request	Binary output SpeedSwitch
OFF mode	Idle speed (page 118)	= 0
MAN mode	Manual	In operation
AUT mode	Automatic by PI loop	In operation
Stop = Not Running	Idle speed (page 118)	In operation
Sd protection	Idle speed (page 118)	In operation
LBI R Reg Disable = 1	Reg Bias (page 133)	In operation



Following example changes the RPM between two levels based on pressure.



Functions 3 and 4

LBI	Active input
RegRequest2	Switch to RegRequest 2
R Reg Disable	Set PI Regulator output to R Bias

LBO	Function
Speed Switch	Regulator Comparator output

Functions 3 and 4 setpoints

Regulator	Values
LAI SpeedRequest	OFF CU: AI1-AI9 AIO: AI1-AI4
Reg Input	CU: AI1-AI9 AIO: AI1-AI4 RPM-BI3
Reg Bias	0 - 10000
Request1	±10000
Request2	±10000
Reg Gain	±0.0 - 200.0 %
Reg Integral	+0.0 % - 100.0 %
Reg CMP Input	CU: AI1-AI9 AIO: AI1-AI4 RPM-BI3
Reg CMP Off	±10000 [-]
Reg CMP On	±10000 [-]

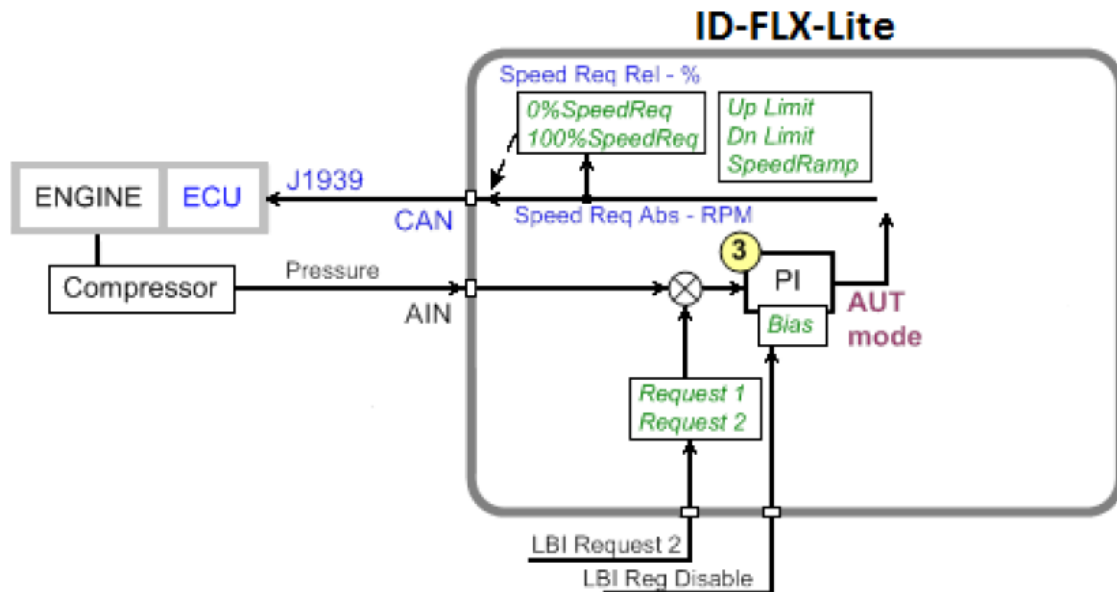
Note: For more information see *Setpoints* on page 91.

Functions 3 and 4 examples

- ▶ Pressure by RPM control via J1939
- ▶ Pressure by RPM control via analog output

Pressure by RPM control via J1939

Actual pressure is measured via Analog input, compared with Requested value and the PI (function 3) output controls the engine RPM via J1939.

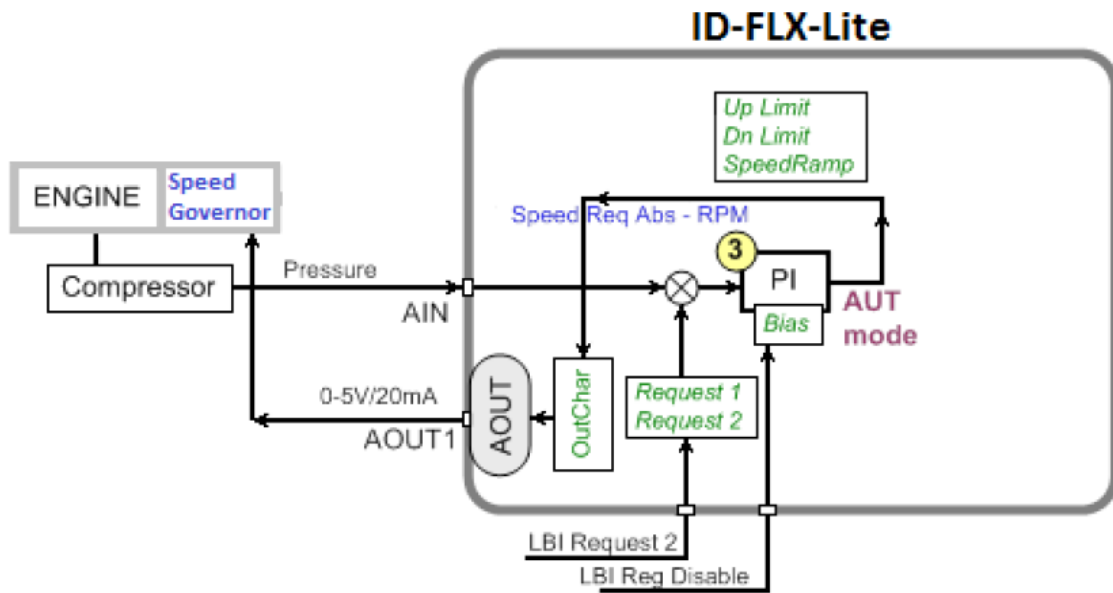


Input	Binary input Binary input	Request 2 R Reg Disable	(optional)
Output	Analog output	Speed Request	
Setpoints	Regulator	Reg Input Reg Bias Request Request 2 Reg Gain Reg Integral	
	Engine params	MinSpeedLim MaxSpeedLim Speed Ramp	

Note: Take care if the Speed request in AUT mode is not limited by Speed Ramp (page 127).

Pressure by RPM control via Analog output

Actual pressure is measured via Analog input, compared with Requested value and the PI (function 3) output controls the engine RPM via Analog output.



Input	Binary input Binary input	Request 2 R Reg Disable	(optional)
Output	Analog output	Speed Request	
Setpoints	Regulator	Reg Input Reg Bias Request Request 2 Reg Gain Reg Integral	
	Engine params	MinSpeedLim MaxSpeedLim Speed Ramp	

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6 Troubleshooting

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- 6.3 Diagnostic messages read from ECU 76
- 6.4 Tier 4 diagnostic codes 78

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6.1 Alarm management

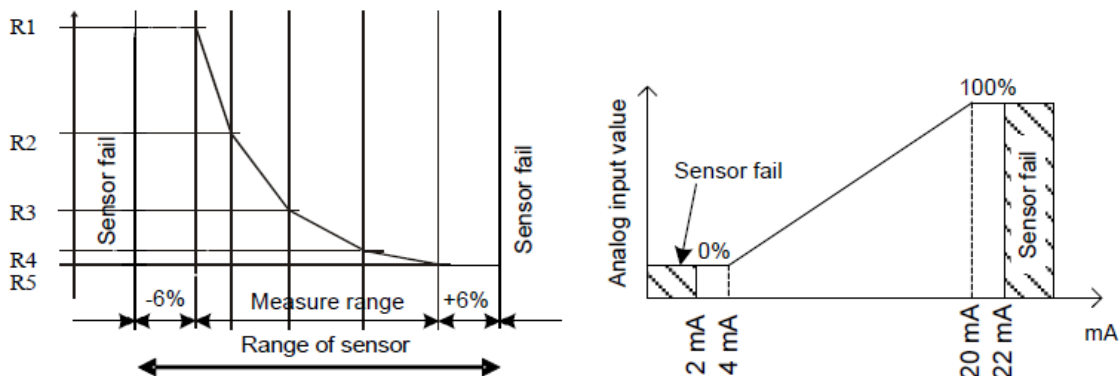
Following alarms are available:

- ▶ Sensor fail
- ▶ Warning
- ▶ Cooldown
- ▶ Shut down

Note: Type of protection for binary and analog inputs is adjustable in PC tool LiteEdit. In window Modify after double click on input adjust Alarm type.

6.1.1 Sensor fail (Fls)

Sensor fail is detected when measured value is 6 % out of selected sensor characteristic. Sensor fail is indicated by ##### symbol instead of measured value.



6.1.2 Warning (Wrn)

When warning comes up, only alarm outputs and common warning output are closed.

Note: For list of possible warning alarms see **List of possible alarms on page 73**.

6.1.3 Cooldown (Cd)

When cooldown comes up, engine is stopped slowly over cooling state.

6.1.4 Shut down (Sd)

When the shutdown alarm comes up, IntelliDrive Lite opens all outputs e.g. FUEL SOLENOID, STARTER and PRESTART to stop the engine immediately. Alarm outputs and common shutdown output are closed. Active or not reset protection disables start.

Note: Engine running only alarms are activated after *Eng prot del* (page 142), after the engine RPM > Starting RPM (page 113) during the engine starting procedure.

Note: If *SPRINKLER* (PAGE 192) is active engine does not react on shutdown protection only for Emergency stop and Overspeed protection.

Sensor fail FIs is detected when measured value is 6 % out of range. Controller screen displays in this case string ##### instead measured value.

Note: For list of possible shut-down alarms see *List of possible alarms on page 73*.

6.1.5 List of possible alarms

Events specification	Protection type	Information on binary output available (see List of LBO on page 201)	Description
Wrn Oil Press	WRN	YES	Oil pressure is smaller than Wrn Oil press setpoint.
Sd Oil Press	SD	YES	Oil pressure is smaller than Sd Oil press setpoint.
Sd NotOilPress	SD	YES	No information about the oil pressure from the binary oil pressure sensor.
Wrn Engine Temp	WRN	YES	Water temperature is greater than Wrn Water temp setpoint.
Sd Engine Temp	SD	YES	Water temperature is greater than Sd Water temp setpoint.
Wrn Fuel Level	WRN	YES	Fuel level is smaller than Wrn Fuel Level setpoint.
Sd Fuel Level	SD	YES	Fuel level is smaller than Sd Fuel Level setpoint.
Ubat	WRN	YES	Battery voltage is out of limits given by Batt overvolt and Batt undervolt setpoints.
Wrn AIN	WRN	YES	Warning alarm configurable on the input of the controller.
Sd AIN	SD	YES	Shutdown alarm configurable on the input of the controller.
Wrn AIO	WRN	YES	Warning alarm configurable on the input of plug-in.

Events specification	Protection type	Information on binary output available (see List of LBO on page 201)	Description
Sd AIO	SD	YES	Shutdown alarm configurable on the input of plug-in.
Binary input	Configurable	YES	Configurable Warning/Shutdown alarms on the inputs of IntelliDrive Lite.
Battery flat	SD	YES	If the controller switches off during starting sequence due to bad battery condition it doesn't try to start again and activates this protection.
Start failed	SD	YES	Engine start failed.
RPM meas fail	SD	NO	At least one running condition was detected (Poil>Starting POil or energized D+) and do not appear RPM>Starting RPM.
ParamFail	NONE	NO	Wrong checksum of parameters. Happens typically after downloading new firmware or changing of the parameter. The controller stays in INIT mode. Check all parameters, write at least one new parameter.
Overspeed	SD	YES	The protection comes active if the speed is greater than Overspeed setpoint.
Underspeed	SD	YES	During starting of the engine when the RPM reached the value of Starting RPM setpoint the starter is switched off and the speed of the engine can drop under Start RPM again. Then the Underspeed protection becomes active. Protection evaluation starts 5 seconds after reaching StartingRPM.
EmergencyStop	SD	NO	If the input Emergency stop is opened shutdown is immediately activated.
PickupFault	SD	NO	Failure of magnetic pick-up sensor for speed measurement.
Stop fail	SD	YES	Engine stop failed.
WrnServiceTime	WRN	NO	The period for servicing is set by the

Events specification	Protection type	Information on binary output available (see List of LBO on page 201)	Description
			NextServTime setpoint. The protection comes active if the running hours of the engine reach this value.
ChrgAlternFail	WRN	YES	Failure of alternator for charging the battery.
SprinklActive	WRN	NO	The protection is active if the output Sprinkler is closed.
Wrn RA15 fail	WRN	NO	Warning alarm in case of lost connection to IGL-RA15 module.
Wrn ECU Alarm	WRN	NO	ECU alarm list is not empty.
Low BackupBatt	WRN	NO	RTC backup battery is flat.

6.2 History file

InteliDrive Lite stores a record of each important event into the history file. The history file seats 255 records. When the history file is full, the oldest records are removed.

Note: To force history download in LiteEdit (direct, modem or internet) open History window and select History | Read history command.

6.2.1 Record structure

Abbreviation	Historical value
Num	Number of historical event
Reason	Event specification
Date	Date of historical event in format DD/MM/YY
Time	Time of historical event in format HH:MM:SS
RPM	Engine speed
RPM3	Engine speed detected on B13
UBat	Battery voltage
OiIP	InteliDrive Lite Analog input 1 value (default Oil pressure)
EngT	InteliDrive Lite Analog input 2 value (default Water temperature)
FLvl	InteliDrive Lite Analog input 3 value (default Fuel level)
AI4	InteliDrive Lite Analog input 4 value
AI5	InteliDrive Lite Analog input 5 value
AI6	InteliDrive Lite Analog input 6 value
AI7	InteliDrive Lite Analog input 7 value
AI8	InteliDrive Lite Analog input 8 value

Abbreviation	Historical value
AI9	InteliDrive Lite Analog input 9 value
AIM1	Plug-in Analog input 1 value
AIM2	Plug-in Analog input 2 value
AIM3	Plug-in Analog input 3 value
AIM4	Plug-in Analog input 4 value
BIN	Binary inputs InteliDrive Lite
BIM	Binary inputs of plug-in
BOUT	Binary inputs InteliDrive Lite
BOM	Binary outputs of plug-in
FC	ECU alarm Failure Code
FMI	ECU alarm Failure Mode Identifier

Note: The ECU values are not recorded to history.

6.3 Diagnostic messages read from ECU

Diagnostic messages are read and displayed in extra ECU Alarm list. For Standard J1939 SPN (Suspect Parameter Number), FMI (Failure Mode Identifier) and OC (Occurrence Counter) are shown together with verbal description if available.

One SPN (Suspect Parameter Number) / FMI (Failure Mode Identify) couple describes one fail information. If FMI is equal to 0 or 1, WRN is displayed in the ECU Alarm list. For any other FMI values, FLS is displayed.

Detail SPM/FMI code specification see in:

- ▶ SAE Truck and Bus Control and Communications Network Standards Manual, SAE HS-1939 Publication
- ▶ Or refer to corresponding engine manufacturer's ECU error codes list.

6.3.1 List of ECU diagnostic codes

Faultcode	Diagnostic code	Faultcode	Diagnostic code	Faultcode	Diagnostic code
51	ThrottlePos	158	BattPotential	636	PositionSensor
91	AccelPedalPos	168	ElectricalPot	637	TimingSensor
94	FuelDelPress	172	AirInlet Temp	639	J1939 CAN Bus
97	WaterInFuelInd	174	Fuel Temperat	651	InjectorCyl#1
98	EngineOilLevel	175	EngOil Temp	652	InjectorCyl#2
100	EngOil Press	189	RatedEngSpeed	653	InjectorCyl#3
101	CrankcasePress	190	EngineSpeed	654	InjectorCyl#4
102	Boost Press	231	J1939 Datalink	655	InjectorCyl#5
105	Intake Temp	237	VIN	656	InjectorCyl#6
106	AirInletPress	515	EngDesOpSpeed	677	EngStartRelay
107	AirFiltDifPres	620	5V SupplyFail	898	RequestedSpeed
108	BarometricPres	626	PrehActuator	970	AuxEngSdSwitch
110	EngCool Temp	628	EMSProgFailure	971	EngDerateSwtch
111	Coolant Level	629	Controller#1	1109	EngSdApproach
153	CrankcasePress	630	CalibrMemFail	1110	Engine Sd

Note: IntelliDrive Lite controller doesn't support J1587 diagnostic line on Volvo engines. This can cause in some cases a J1939 alarm message FC:000608 due to missing J1587 bus. Contact your Volvo distributor to update ECU firmware.

For Scania Fault codes (FC) are displayed. Following messages are available for particular groups of Fault codes:

Faultcode	Diagnostic code	Faultcode	Diagnostic code
0×1000	Overspeed	0×6702	AlternatorChrg
0×1100	EngSpdSensor1	0×6A00	ExhaustBrkAct
0×1200	EngSpdSensor2	0×B000	OilPressProt
0×2000	WtrTempSensor	0×B100	CoolantLevProt
0×2100	ChrgAirTmpSens	0×B200	OverheatCoolWt
0×2200	ChrgAirPrsSens	0×B300	EmergencyStop
0×2300	OilTempSensor	0×B501	CoolantLevel
0×2400	OilPressSensor	0×C000	PDEInjectorCyl1
0×2600	SensorSupply1	0×C100	PDEInjectorCyl2
0×2700	SensorSupply2	0×C200	PDEInjectorCyl3
0×2800	ExtrAnalogInp	0×C300	PDEInjectorCyl4
0×3200	BatteryVoltage	0×C400	PDEInjectorCyl5
0×3300	CAN msg not ok	0×C500	PDEInjectorCyl6
0×3403	CAN version	0×C600	PDEInjectorCyl7
0×4300	HWWatchdog	0×C700	PDEInjectorCyl8

Faultcode	Diagnostic code	Faultcode	Diagnostic code
0×6200	FanActuator	0×E200	OverheatProt
0×6400	WasteGateAct	0×E600	CoordEmergStop
0×6600	StarterActuatr		

6.4 Tier 4 diagnostic codes

If the configured ECU supports Tier 4 standard, on the controller screen are displayed supplementary values relative to the DPF status.

In ECU list-5.6 supported for John Deere, Cummins CM2250, CM850 and Deutz EMR4.

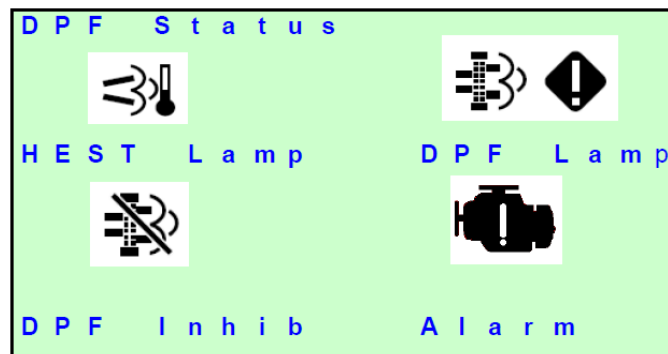




Table 6.1 Practical example of the screen

Meaning of the pictograms

	HEST Lamp SPN 3698	Exhaust High Temperature. Visible when SPN 3698 = 1
	DPF Inhibit SPN 3702	Visible when SPN 3702 = 1
	DPF Lamp SPN 3696 SPN 3697	Visible when CM1: SPN 3696 (Force switch) = 1 or SPN 3697 (DPF Lamp Command) = 1. Blinks – changes to inverse (1Hz) when 3697 = 100.
	DPF Lamp + Warning	Active when 3697 = 1 and SPN 3701 = 4

	<p>DPF Lamp + STOP</p>	<p>Active when 3697 = 1 and SPN 3701 = 5</p>
	<p>Yellow Lamp</p>	<p>Active when DM1 Yellow lamp is active.</p>
	<p>Red Lamp</p>	<p>Active when DM1 Red lamp is active.</p>

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7 Communication

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Note: Refer to *InteliCommunication Guide* for all additional information.

7.1 Direct cable connection

InteliDrive Lite can be connected directly with PC via optional communication plug-in modules IL-NT RS232, IL-NT RS232-485, IL-NT S-USB.

Use the standard serial / USB cable to connect PC with InteliDrive Lite. In the area with electromagnetic interference should be used shielded cables.

Note: Make sure the grounding system on controller and PC – COM port (negative of the PC DC supply) are identical – before the first direct connection. There must not be any voltage between these two points otherwise the internal reversible fuse in controller burns out. The simple solution is to assure, that the PC supply 240/20 V is ground free (GND terminal is not connected).

The setpoint COM1 Mode or COM2 Mode (according to the interface used) must be set to DIRECT position for this kind of connection.

The communication speed of direct connection is up to 38400 bps, via USB it is up to 115200 bps.

Note: The RS485 communication line has to be terminated by 120 Ω resistors on both ends. RS485 uses channel COM2 in InteliDrive controller.

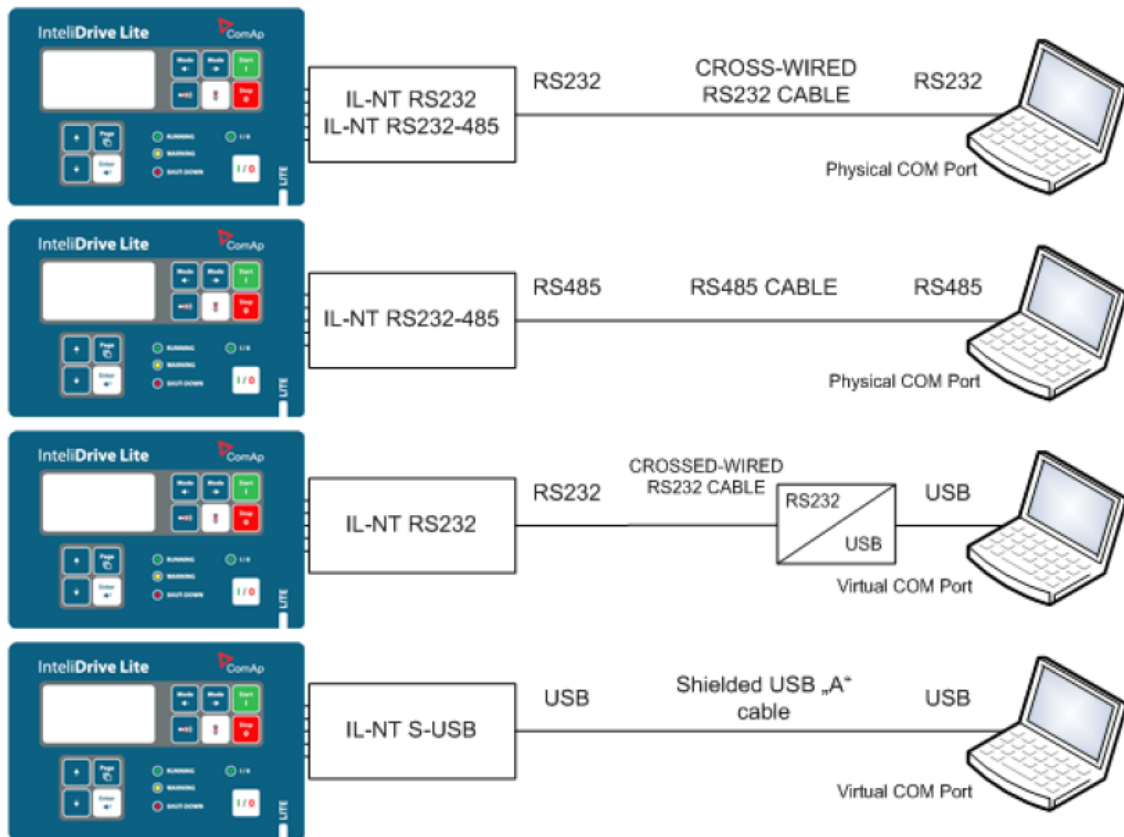


Table 7.1 Direct cable connection types

Note: It is possible to create multiple controller connection through RS485. Be aware of controller address collision. Manage address setting for each controller in **ControllerAddr** (page 103).

Note: ComAp recommends using galvanically separated cable.

7.2 Remote connection

7.2.1 Internet connection

IntelDrive Lite controllers can be monitored from PC tools as LiteEdit or IntelliMonitor over the Internet using IntelliBridge-NT connected to the controller via IL-NT RS232-485 port, via optional IB-Lite plug-in module or via IL-NT GPRS for cellular internet network, **see Group: Communication settings on page 103**.

7.2.2 AirGate connection

IntelDrive Lite controllers can be monitored from PC tools as LiteEdit or IntelliMonitor via AirGate. AirGate technology is for easy plug and play wireless communication. Common SIM card with GPRS service is suitable for this system. It overcomes problems with special SIM card (fixed and public IP) necessity, with firewalls and difficult communication settings. For AirGate connection is possible to use IB-NT, IB-Lite or IL-NT GPRS modules. For setting **see Group: Communication settings on page 103**.

7.2.3 Modem connection

PC can be connected to the controller also remotely via modems. Either an analog, GSM, ISDN or 3G modem must be connected to the RS232 interface, **see Group: Communication settings on page 103**: COM1 Mode has to be set to MODEM.

Note: RF modem communication is also possible between controller and remote display.

Note: In case of controller and remote display RF modem should be connected with serial cable with only three connected pins Rx, Tx and GND. In other case could be blocked communication between modem and controller.

7.3 Modbus connection

Modbus protocol was implemented into the controllers to allow design of own supervision software offering customer or to use ComAp SCADA software.

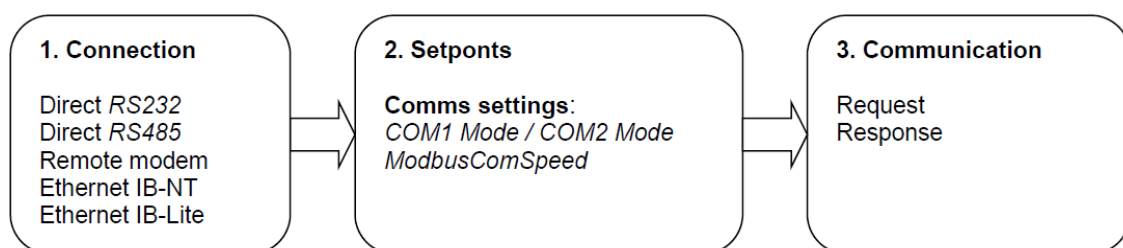
To learn more about Modbus interface see the training videos on [Basic Modbus I](#) and [Basic Modbus II](#).

7.3.1 Modbus step by step

Use LiteEdit: Controller->Generate Cfg image->Modbus registers command to get registers list.

- ▶ 9600 bps, 8 data bits, 1 stop bit, no parity
- ▶ Transfer mode RTU
- ▶ Function 3 (Read Multiply Registers) max length of block is 127 registers
- ▶ Function 6 (Write Single Register)
- ▶ Function 16 (Write Multiply Registers) max 16 registers
- ▶ The response to an incoming message is sent with minimum 4.096 ms delay after message reception

The complete description of Modbus communication protocol can be found in Modbus Protocol Reference Guide PI-MBUS-300 and Open Modbus Specification Release 1.0. Both documents are available from web site at www.modicon.com.



Example: Request: 01 03 00 35 00 03 15 C5

- 01 = Controller address
- 03 = Modbus function code (Read Multiple Registers)
- 00 35 = Register address: Register number (40054) – 40001 = 53 DEC => 35 HEX IL-NT
- 00 03 = Register address: Register number (40061) – 40001 = 60 DEC => 3C HEX IC-NT
- 00 03 = Number of registers (40054 – Oil press, 40055 – Engine temp, 40056 – Fuel level)
- 00 03 = 3 DEC => 03 HEX
- C5 15 = CRC (write LSB MSB !)


Register(s)	Com.Obj.	Name	Dim	Type	Len	Dec	Min	Max	Group
40051	8213	Battery volts	V	Integer	2	1	-	-	Controller
40052	10124	(N/A)							
40053	10603	D+	V	Integer	2	1	-	-	Controller
40054	8227	Oil Pressure	Bar	Integer	2	1	-	-	Controller
40055	8228	Engine Temp	°C	Integer	2	0	-	-	Controller
40056	8229	Fuel Level	%	Integer	2	0	-	-	Controller
40057	8978	IOM A11	U4	Integer	2	0	-	-	Extension

Image 7.1 A part of Cfg Image (Modbus Register ...)

Example: Response: 01 03 06 00 27 00 2E 00 2B 35 64

- 01 = Controller address
- 03 = Modbus function code (Read Multiple Registers)
- 06 = Length of read data in Bytes (in HEX)
- 00 27 = 27 HEX => 39 DEC => 3,9 Bar (Oil pressure is represented with 1 decimal in Bars)
- 00 2E = 2E HEX => 46 DEC => 46°C (Engine temperature is represented with 0 decimals in °C)
- 00 2B = 2B HEX => 43 DEC => 43% (Fuel level is represented with 0 decimals in %)
- 64 35 = CRC

7.4 ECU engine support

InteliDrive Lite firmware branch covers both standard and electronic controlled (monitored) engines. The appropriate engine / ECU type is selected in PC tool LiteEdit like other peripherals. Press the  button in LiteEdit configuration window Modify.

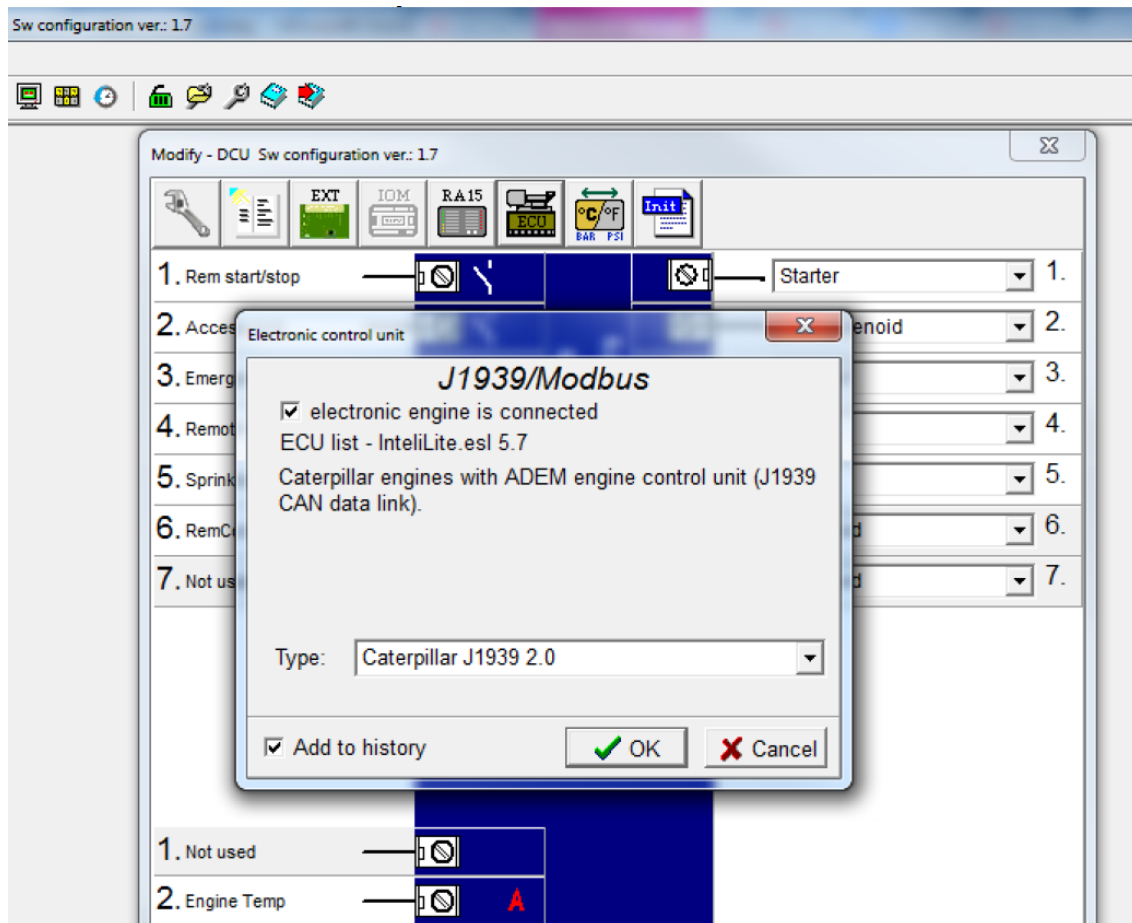
Note: Import latest ECU list – ECU list-x.x.iwe for update engine ECU specification.
Select the proper esl file in LiteEdit->Options->ESL files - typically Allspeed.esl.

IMPORTANT: More information about ECU list packages, values, configuration and wiring recommendations can be found in Comap Electronic Engines Support manual.

The InteliDrive Lite controller always sends either speed request = 0 % or the IDLE command via J1939 in controller Idle state. In the MAN mode the Idle operation can be controlled by NOMINAL/IDLE (PAGE 195).

7.5 Choosing the ECU to configure

According to the model of ECU, choose and configure the right ECU option. The configuration can be made in LiteEdit, the window Modify, icon ECU.



Note: If the connected engine is Cummins communicating via RS232, it is necessary to set the setpoint Basic settings: COM1 mode (or COM2 mode if IL-NT RS232-485) = ECULINK.

Loss of communication causes shutdown of the running engine. On the contrary, the ECU can be switched off at quiescent engine that means not-communicating ECU is in that moment normal situation. All values from ECU shall show #####, but no alarm is displayed. The output ECU CommOK follows the real situation that means it is not active anytime when the ECU does not communicate.

The **ECU PWRRELAY** (PAGE 214) closes at the beginning of prestart and opens if the engine shall be stopped.

The engine is started via standard contact output or via CAN bus.

Practical examples of values read from ECU

Value name	Short name	Dimension	Type	Frame name
EngOil Filter Diff.Press	OilDiffPres	bar	ANA	DD
Amber Warning Lamp	AmberWrnLamp	-	BIN	DM1
Malfunction Lamp	MalfunctLamp	-	BIN	DM1
Protect Lamp	ProtectLamp	-	BIN	DM1
Red Stop Lamp	RedStopLamp	-	BIN	DM1
Engine speed	RPM	RPM	ANA	EEC1
Engine Oil Pressure	EngOil Press	bar	ANA	EFLP1
Coolant Temp	Coolant Temp	°C	ANA	AT1

Value name	Short name	Dimension	Type	Frame name
Total Engine Hours	EngineHours	h	ANA	HR
Boost Pressure	Boost Press	bar	ANA	IC
Intake Manifold Temp	Intake Temp	°C	ANA	IC

If Cummins-Modbus x.x option is selected, following values are read from Modbus Register Data (for QSX15, QSK45, QSK60):

Value name	Short name	Dimension	Type	Frame name
Red Shutdown Lamp	Red Lamp	-	BIN	10005
Yellow Warning Lamp	Yellow Lamp	-	BIN	10006
Engine Speed	RPM	RPM	ANA	30001
Coolant Temp	Coolant Temp	°C	ANA	30002
Oil Pressure (psig)	Oil Press	bar	ANA	30003
Oil Pressure (psia)	Oil Press	bar	ANA	30003
Running Time	Running Time	h	ANA	30008
Fuel Rate (UK)	Fuel	L/h	ANA	30018
Fuel Rate (US)	Fuel	L/h	ANA	30018
Intake Manifold Press	Intake Press	bar	ANA	30530
Intake Manifold Temp	Intake Temp	°C	ANA	30531

7.6 ECU Analog inputs

Reading of mentioned values from ECU enables to use analog inputs of the unit for other purposes, e.g. measuring, displaying and alarm activation related to various quantities. The configuration thus allows using nine analog inputs on the central unit and four analog inputs on plug-in module if connected.

If the engine without ECU is controlled by IntelliDrive Lite, the first analog input is permanently configured to Oil Pressure, other analog inputs remain freely configurable.

7.7 Tier 4 engines support

When the configured ECU supports Tier4 standard, on the controller appears a supplementary screen where are displayed the values relative to the Tier4.

U	r	e	a	T	a	n	k	L	e	v	e	l		X	X	X		%
U	r	e	a	T	a	n	k		T	e	m	p		X	X	X		° C
U	r	e	a		Q	u	a	n	t	i	t	y		X	X	X	X	g / h
C	a	t	a	l			U	p	T	e	m	p		X	X	X		° C

C	a	t	a	l	D	o	w	n	T	e	m	p		X	X	X	°	C	
U	r	e	a		P	r	e	s	s	u	r	e		X	X	X	k	P	a

E	C	U		S	t	a	t	e									0	0	0			
E	C	U		Y	e	l	l	o	w	L	a	m	p					0				
E	C	U		R	e	d	L	a	m	P								0				
W	a	i	t	T	o	S	t	r	t									0				
S	p	e	e	d	R	e	q		A	b	s							0				
S	p	e	e	d	R	e	q		R	e	l						8	0	0	R	P	M
S	o	o	t		L	o	a	d									1	0	0	%		
A	s	h			L	o	a	d									1	0	0	%		

Note: Tier4 values Soot Load and Ash Load are visible on ECU screen as well.

 back to Communication

8 Technical data

Power supply

Power supply range	8-36 VDC
Power supply drop-out immunity	100 ms from min. 10 V return to min. 8 V
Power consumption	40-440 mA depend on supply voltage and temperature
Consumption depends on supply voltage	0.104 A / 8 VDC 0.080 A / 12 VDC 0.051 A / 24 VDC 0.044 A / 30 VDC 0.040 A / 36 VDC
Battery voltage measurement tolerance	2 % at 24 V

Note: For the supply voltage less than 7 V the backlight of the display is switched off. Short-term voltage drops (e.g. during the engine cranking) do not affect the operation at all.

Operating conditions

Operating temperature IntelliDrive Lite	-20 °C to +70 °C
Operating temperature IntelliDrive Lite LT	-40 °C to +70 °C
Storage temperature	-30 °C to +80 °C
Protection front panel	IP65
Impact protection	EN 62262, EN 50102 (IK04)
Humidity	95 % w/o condensation
Low Voltage Directive	EN 61010-1:95 +A1:97
Electromagnetic Compatibility	EN 50081-1:94, EN 50081-2:96 EN 50082-1:99, EN 50082-2:97
Vibration	5-25 Hz, ± 1.6 mm 25-100 Hz, $a = 4$ g
Shocks	$a = 200$ m/s ²

Dimensions and weight

Dimensions	180 × 120 × 55 mm
Weight	450 g

Binary inputs

Number of inputs	7
Input resistance	4.2 k Ω
Input range	0-36 VDC
Switching voltage level for	0-2 V DC close contact; 8-36 V DC open contact

close/open contact indication	
-------------------------------	--

Binary outputs

Number of outputs	7
Maximum current	0.5 A
Max switching voltage	36 V DC

Analog inputs

Number of inputs	9, 3 resistive and 6 voltage
Resolution	10 bits
Wiring selectable range	V, Ω , mA
Maximal resistance range	2400 Ω
Maximal voltage range	0-20 mA
Current range	0-20 mA
Resistance measurement tolerance	± 2 % ± 2 Ω out of measured value

Speed pick-up input

Minimum input voltage	2 Vpk-pk (from 4 Hz to 4 kHz)
Maximum input voltage	50 Veff
Measured frequency	4 Hz to 10 kHz
Frequency measurement tolerance	0.2 %

D+ function

Max. D+ output current	300 mA
Guaranteed level for signal	80 % of supply voltage

CAN bus interface

Max CAN bus length	200 m
Speed	250 kBd
Nominal impedance	120 Ω
Cable type	twisted pair (shielded)
Nominal Velocity	min. 75 % (max. 4.4 ns/m)

of Propagation	
Wire crosscut	min. 0.25 mm ²
Maximal attenuation (at 1 MHz)	2 dB / 100 m

Recommended Industrial Automation & Process

Control Cables:

▶ BELDEN (see www.belden.com):

- 3082A DeviceBus for Allen-Bradley
DeviceNet
- 3083A DeviceBus for Allen-Bradley
DeviceNet
- 3086A DeviceBus for Honeywell SDS
- 3087A DeviceBus for Honeywell SDS
- 3084A DeviceBus for Allen-Bradley
DeviceNet
- 3085A DeviceBus for Allen-Bradley
DeviceNet
- 3105A Paired EIA Industrial RS485 cable

▶ LAPP CABLE (see www.lappcable.com)

- Unitronic BUS DeviceNet Trunk Cable
- Unitronic BUS DeviceNet Drop Cable
- Unitronic BUS CAN
- Unitronic-FD BUS P CAN UL/CSA

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9 Appendix

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9.1 Controller objects

9.1.1 List of controller objects types

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9.1.2 Setpoints

What setpoints are:

Configuration of Setpoints is possible through panel buttons as is described above or via ComAp PC tool LiteEdit, where the setting can be open by click on the icon .

List of setpoint groups

Group: Basic settings	94
Group: Communication settings	103
Group: Engine parameters	113
Group: Regulator	131
Group: Load limit	138
Group: Engine protection	142
Group: Date/Time	175
Group: Sensors Spec	181
Group: AIO module	184
Group: Act. Calls/SMS	186

For full list of setpoints go to the chapter **List of setpoints (page 92)**.

Password


EnterPassword

Password is a four-digit number. Password enables change of relevant protected set points Use ↑ or ↓ keys to set and ENTER key to enter the password. There are 3 levels of passwords. Knowledge of higher password lets you to change setpoint protected by lower password.

ChangePassword

Use ↑ or ↓ button to set and ENTER button to change the password.

Note: At first the Password has to be entered before the new Password can be changed.

Can be used LiteEdit PC tool for changes of Password level in window Modify press button  Password for each of three levels can be adjusted from the menu Controller->Change password...

List of setpoints

Group of setpoints:

Basic settings

Engine name	94
Gear teeth	94
RPMbyWterminal	96
Nominal RPM	96
GearTeethBI3	96
RPM source	98
RA-FailDetect	98
ControllerMode	99
FltResGoToMAN	99
DispBacklightTO	100
Panel Button	100
RunHoursSource	102
Main Screen	102

Group of setpoints:

Communication

Settings

ControllerAddr	103
COM1 Mode	103
COM2 Mode	104
ModemIniString	104
ModbusComSpeed	105
IBLite IP Addr	105
IBLite NetMask	106
IBLite GatelP	106
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ComAp Port	107
APN Name	108
APN UserName	108
APN UserPass	109
AirGate	109
AirGate IP	110
SMTP UserName	110
SMTP UserPass	111
SMTP Server IP	111

Contr MailBox	112
Time Zone	112
DNS IP Address	113

Group of setpoints:

Engine parameters

Starting RPM	113
Starting POil	114
Prestart time	114
Preglow time	115
PreheatTemp1	115
PreheatTime1	115
PreheatTemp2	116
PreheatTime2	116
PreheatSensor	116
MaxCrank time	117
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Idle time	118
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Cooling speed	119
Cooling time	119
AfterCool time	120
Stop time	120
Fuel solenoid	120
FuelSol offset	121
D+ function	123
ECU Control	123
ECU SpeedAdj	124
RetToSpeedAdj	124
ReliefVal time	125
MinSpeedLim	125
MaxSpeedLim	126
BI Speed Sel 1	126
BI Speed Sel 2	127
BI Speed Sel 3	127
Speed Ramp	127
0%ofSpeedReq	129
100%ofSpeedReq	129
Conveyor horn	130

Running timer	130
FuelTankVolume	130
MaxFuelDrop	131

Group of setpoints:

Regulator

LAI SpdRequest	132
Reg Input	132
Reg Bias	133
Request 1	133
Request 2	133
Reg Gain	134
Reg Integral	134
Reg CMP Input	136
Reg CMP On	136
Reg CMP Off	137
AUT SpdReq	137

Group of setpoints:

Load limit

Load input	138
Load Bias	139
LoadRequest 1	139
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LoadUpLimit	140
LoadDnLimit	140
Load Gain	141
Load Integral	141
Load CMP Input	141
Load CMP Off	142
Load CMP On	142

Group of setpoints:

Engine protection

Eng prot del	142
BIN6 delay	143
Horn timeout	143
StartOverspeed	144
Overspeed	144

Underspeed	144	AIN6 LowDel	161	Timer2Function	179
Flow SwitchDel	145	AIN6 HighWrm	161	Timer2repeat	180
UnderspeedSd	145	AIN6 HighSd	162	Timer2 ON time	180
AIN1 Level 1	147	AIN6 HighDel	162	Timer2Duration	181
AIN1 Level 2	147	AIN7 Level 1	162		
AIN1 Del	147	AIN7 Level 2	163	Group of setpoints:	
AIN2 Level 1	148	AIN7 Del	163	Sensors Spec	
AIN2 Level 2	148	AIN7 Eval	164	Calibr AI1, AI2, AI3, AI4,	
AIN2 Del	148	AIN7 LowWrm	164	AI5, AI6, AI7, AI8, AI9	181
AIN3 Level 1	149	AIN7 LowSd	165	Calibr AIO1, AIO2, AIO3,	
AIN3 Level 2	149	AIN7 LowDel	165	AIO4	182
AIN3 Del	149	AIN7 HighWrm	165	CounterConst 1,	
Batt overvolt	150	AIN7 HighSd	166	CounterConst 2	183
Batt undervolt	150	AIN7 HighDel	166	Counter mode 1, Counter	
Batt volt del	150	AIN8 Level 1	166	mode 2	184
AIN4 Level 2	151	AIN8 Level 2	167		
AIN4 Del	151	AIN8 Del	167	Group of setpoints:	
AIN4 Eval	152	AIN9 Level 1	167	AIO module	
AIN4 LowWrm	152	AIN9 Level 2	168	AnInAIO1, AIO2, AIO3,	
AIN4 LowSd	153	AIN9 Del	168	AIO4 lev1	184
AIN4 LowDel	153	NextServTime	169	AnInAIO1, AIO2, AIO3,	
AIN4 HighWrm	153	GearBoxRatio	169	AIO4 lev2	185
AIN4 HighSd	154	RPMdiff Sd	171	AnInAIO1, AIO2, AIO3,	
AIN4 HighDel	154	RPMdiff Wrm	172	AIO4 del	185
AIN5 Level 1	154	RPMdiff delay	173		
AIN5 Level 2	155	BIN1 Prot Del...BIN7 Prot		Group of setpoints:	
AIN5 Del	155	Del	174	Act. Calls/SMS	
AIN5 Eval	156	DEF Level Min	174	Yel Alarm Msg	186
AIN5 LowWrm	156	DEF Level Max	175	Red Alarm Msg	187
AIN5 LowSd	157			TelNo/Addr Ch1, 2	187
AIN5 LowDel	157				
AIN5 HighWrm	157	Group of setpoints:		⬆ back to Controller	
AIN5 HighSd	158	Date/Time		objects	
AIN5 HighDel	158	Time stamp per	175		
AIN6 Level 1	158	SummerTimeMod	176		
AIN6 Level 2	159	Time	176		
AIN6 Del	159	Date	177		
AIN6 Eval	160	Timer1Function	177		
AIN6 LowWrm	160	Timer1repeat	178		
AIN6 LowSd	161	Timer1 ON time	178		
		Timer1Duration	179		

Group: Basic settings

Engine name

Setpoint group	Basic settings	Related FW	2.3.0
Range [units]	[-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object	8637	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
User defined name, used for engine – IntelliDrive Lite identification at remote phone or mobile connection. Engine name is maximally 14 characters long and have to be entered using LiteEditsoftware.			

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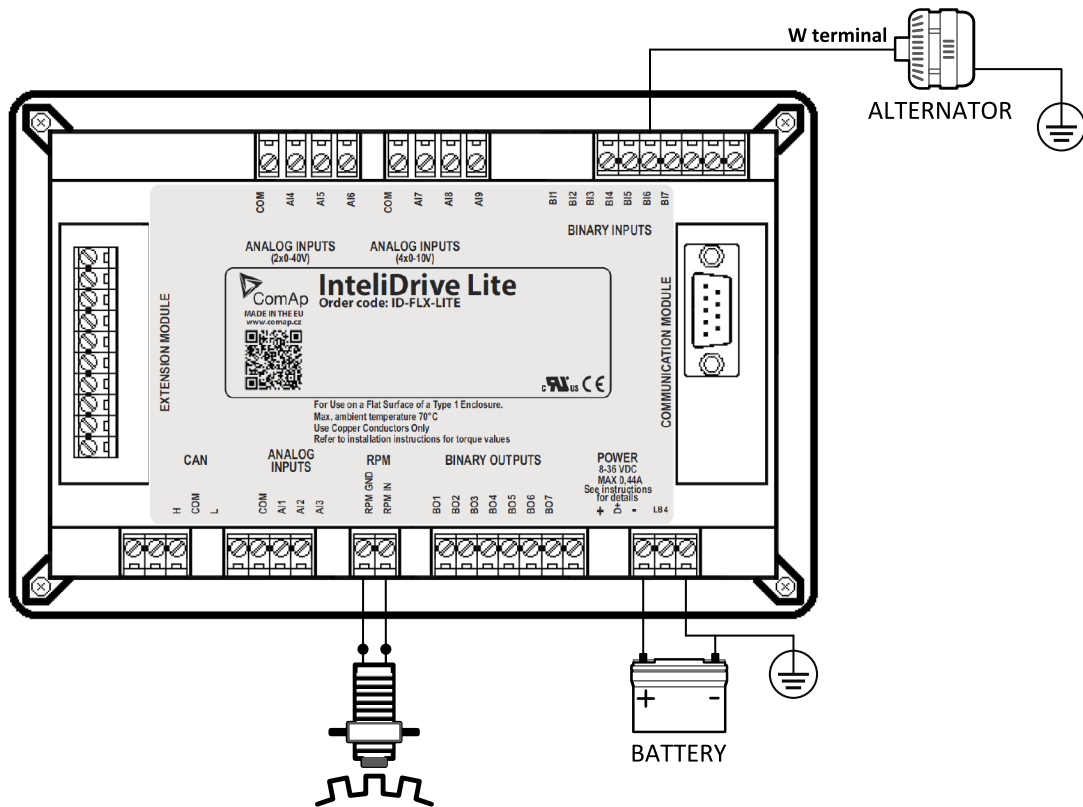
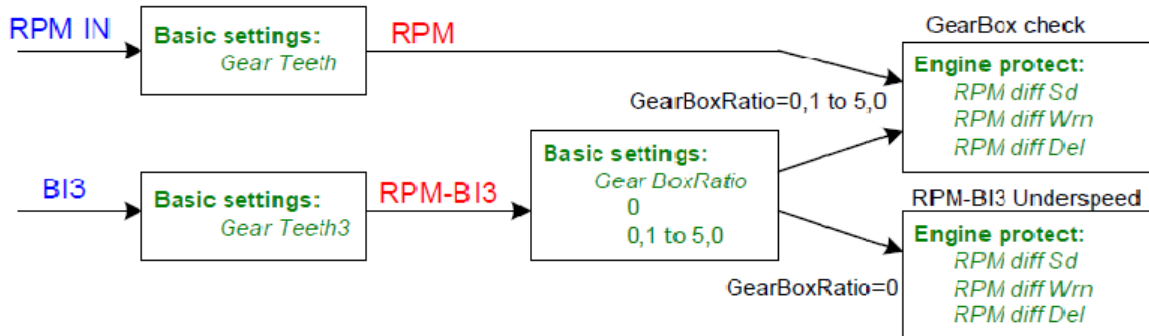
Gear teeth

Setpoint group	Basic settings	Related FW	2.3.0
Range [units]	0 .. 500 [-]		
Default value		Force value Alternative config	YES
Step	1		
Comm object	8252	Related applications	
Config level	Standard		

Setpoint visibility Always

Description

The number of teeth on the engine gear for the pick-up sensor. The setpoint is ignored when ECU is configured.



Note: The RPM pickup input is ignored when Engine params: Gear teeth = 0. The engine running state is then detected based on *Starting POil* (page 114) or *D+ function* (page 123) = ENABLED.

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RPMbyWterminal

Setpoint group	Basic settings	Related FW	2.3.0
Range [units]	50.00 .. 200.00 [-]		
Default value	1	Force value Alternative config	YES
Step	0.01		
Comm object	8420	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The constant of this setpoint multiplies the speed value obtained from the controller input RPM.			
<p>Note: The default value is and must be 1, when the classical pick-up speed sensor is used to measure the engine speed.</p> <p>The setpoint is usefull when the engine does not have the speed sensor and the speed is measured by the W terminal of the charging alternator. The setpoint allows tuning the ratio between the frequency and the RPM value which can not to correspond to the entire values of teeth numbers (because of the different non-integral ratio of the engine and alternator pulleys).</p>			

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Nominal RPM

Setpoint group	Basic settings	Related FW	2.3.0
Range [units]	100 .. 4000 [RPM]		
Default value		Force value Alternative config	YES
Step	1		
Comm object	8253	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Nominal engine speed, base for overspeed protection and scale on RPM gauges.			

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GearTeethBI3

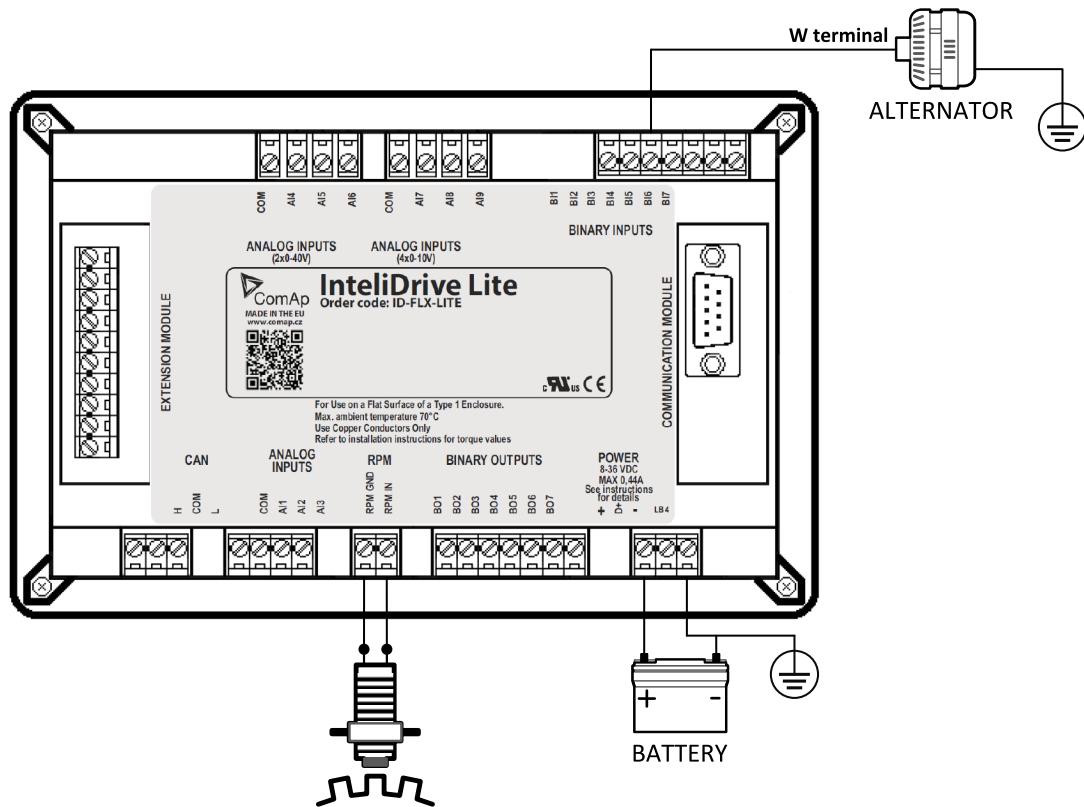
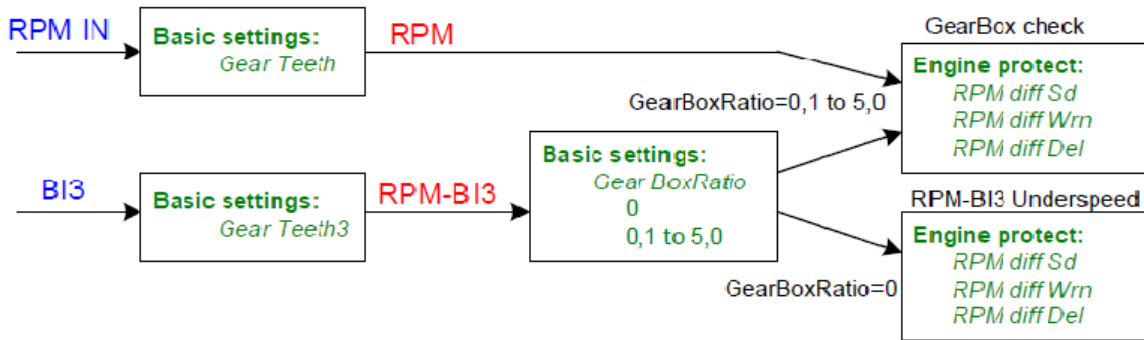
Setpoint group	Basic settings	Related FW	2.3.0
Range [units]	0 .. 10 [-]		
Default value		Force value Alternative config	YES
Step	1		
Comm object	11475	Related applications	
Config level	Standard		

Setpoint visibility	Always
----------------------------	--------

Description

The second RPM (RPM-BI3 value) can be measured in limited frequency range 1 to 50 Hz on Binary input 3. The RPM-BI3 value indicates RPM calculated from BI3 frequency and Basic settings: GearTeeth3 setpoint. The RPM-BI3 value =0 below 1 Hz and =### over 50 Hz.

Configure BI Type = Not used and change the name according to the function for RPM-BI3 measuring.



Note: The RPM-BI3 measuring is switched off when Basic setting: GearTeethBI3 = 0. In this case BI3 operates as standard Binary input.

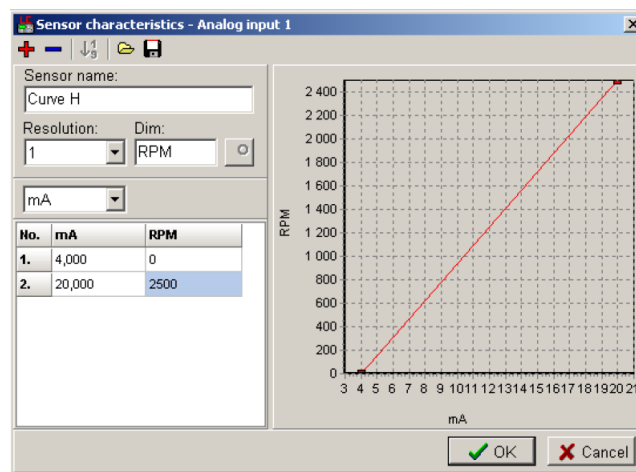
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RPM source

Setpoint group	Basic settings	Related FW	2.3.0
Range [units]	[Pickup, AIO-AIN1, AIO-AIN2, AIO-AIN3, AIO-AIN4]		
Default value		Force value Alternative config	YES
Step	-		
Comm object	12142	Related applications	
Config level	Standard		
Setpoint visibility	Always		

Description

Switch from where the RPM is measured. When source is Analog input the converted value is going to be in RPM range.



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RA-FailDetect

Setpoint group	Basic settings	Related FW	2.3.0
Range [units]	ENABLED / DISABLED [-]		
Default value	ENABLED	Force value Alternative config	NO
Step	-		
Comm object	14599	Related applications	N/A
Config level	N/A		
Setpoint visibility	Always		

Description

This setpoint is used to enable or disable fail detect function of RA15 module which enables or disables alarm announcement in case RA15 is configured but not communicating.

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ControllerMode

Setpoint group	Basic settings	Related FW	2.3.0
Range [units]	[OFF, MAN, AUT]		
Default value		Force value Alternative config	YES
Step	-		
Comm object	8315	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Equivalent to Controller mode changes by MODE→ or ←MODE buttons.			
<i>Note: Controller Mode change can be separately password protected.</i>			

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FitResGoToMAN

Setpoint group	Basic settings	Related FW	2.3.0
Range [units]	[ENABLED, DISABLED]		
Default value		Force value Alternative config	YES
Step	-		
Comm object	9983	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
DISABLED	Controller stays in AUT mode after Fault reset. Default state.		
ENABLED	Automatic switch from AUT to MAN mode after Fault reset to avoid automatic engine start. This function is active for Shut down protection only.		

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DispBacklightTO

Setpoint group	Basic settings	Related FW	2.3.0
Range [units]	0 .. 60 [min]		
Default value	0 ... means that the display lights all the time	Force value Alternative config	YES
Step	1 [min]		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The display backlight is switched off after timeout.			

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Panel Button

Setpoint group	Basic settings	Related FW	2.3.0
Range [units]	[Nom/Idle, N/I Init, Conveyor, RegReqst, R RegDis, CloseLoad, Toggle]		
Default value		Force value Alternative config	YES
Step	-		
Comm object	12619	Related applications	
Config level	Standard		

Setpoint visibility	Always
Description	
Adjust the function of front panel button I/O.	
Default state	Nom/Idle
Nom/Idle	Switches between Nominal and Idle speed request. The function is allowed in MAN mode only, after reaching the status RUN and the requested speed set by the setpoint ECU SpeedAdj. (i.e. not during IDLE speed warm-up run in Starting status).
N/I Init	Switching between Nominal and Idle speed request. After the starting, the speed according to the setpoint Idle Speed is reached and this status is maintained until the I/O button is pressed. The function is allowed in MAN mode only and is blocked during Cooling time.
<p>Note: When NOMINAL/IDLE (PAGE 195) is configured (to a physical binary input), it has priority and the switching between the nominal and the idle speed by I/O button is blocked.</p>	
Conveyor	Initial condition: Running engine. Press I/O button activates HORN (PAGE 205) . After the horn signal, the CONVEYOR (PAGE 215) is activated.
RegReqst	Switches between setpoints Request 1 (page 133) and Request 2 (page 133) as requested value input for regulator.
R RegDis	In AUT mode, switching the I/O button allows or disable the PI regulation to work. When the regulation is blocked, the regulator analog output is set according to the constant Reg Bias (page 133) .
CloseLoad	When the engine is in the status READY TO LOAD (PAGE 206) , this option switches ON and OFF the CLOSE LOAD (PAGE 216) . When the engine is not in the status Ready to load (page 206) , the button has no influence.
<p>Note: The applications without the information about the speed can not reach the status READY TO LOAD (PAGE 206) and therefore, the load can not be switched by the I/O button. That's why, in the case of settings: Gear teeth (page 94) = 0, RPM source (page 98) = PickUp, no ECU, the condition sufficient for CLOSE LOAD (PAGE 216) activating by the I/O button is the Running state.</p>	
Toggle	Switches ON and OFF the TOGGLE (PAGE 216) , no other consequences.

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RunHoursSource

Setpoint group	Basic settings	Related FW	2.3.0
Range [units]	[ECU, INTERNAL, AUTO]		
Default value		Force value Alternative config	YES
Step	-		
Comm object	13345	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is used for adjustment of RunHours source of the engine.			
ECU	RunHours are all the time read from ECU.		
INTERNAL	RunHours are counted from the inner counter of the controller.		
AUTO	If is coming from ECU rational value higher than 0, then the RunHours are taken from ECU, in second case are displayed internal hours from controller. Default state.		
<div style="background-color: #f0f0f0; padding: 5px;"> IMPORTANT: Some types of ECUs reset RunHours counter to 0, if the supply was disconnected. </div>			

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Main Screen

Setpoint group	Basic settings	Related FW	2.3.0
Range [units]	[SHOW TIMERS, SHOW AIN]		
Default value		Force value Alternative config	YES
Step	-		
Comm object	13346	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Change the display of the main Measurement screen.			
SHOW TIMERS	Standard display with timers on the left side of the screen. Default state.		
SHOW AIN	Instead of timers are on the left side of the screen displayed values of analog inputs AIN6 and AIN7.		

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Group: Communication settings

ControllerAddr

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
It is controller's identification number. It is possible to set controller address different from the default value 1 so that more IntelliDrive Lite controllers can be interconnected (via RS485) and accessed e.g. from Modbus terminal.			
Adresses 1 .. 32			
<i>Note: When opening connection to the controller its address has to correspond with the setting in PC tool.</i>			

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COM1 Mode

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[DIRECT / MODEM / MODBUS / ECU LINK]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Communication protocol switches for the COM1 channel.			
DIRECT	LiteEdit communication protocol via direct cable or AirGate, WebSupervisor communication protocol via AirGate.		
MODEM	LiteEdit communication protocol via modem.		
MODBUS	Modbus protocol. See detailed description in IntelliDrive Communication Guide .		
ECU link	Protocol for communication with Cummins engines via Modbus.		
<i>Note: For details on communication speed and other technical parameters please see Technical data on page 87.</i>			
<i>For detail description see chapter Modbus protocol.</i>			

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COM2 Mode

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[DIRECT/MODBUS/ECU LINK]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Communication protocol switches for the COM2 channel, if dual communication module is plugged in.			
DIRECT	LiteEdit communication protocol via direct cable.		
MODBUS	Modbus protocol. See detailed description in InteliDrive Communication Guide .		
ECU link	Protocol for communication with Cummins engines via Modbus.		
<p>Note: For details on communication speed and other technical parameters please see Technical data on page 87.</p> <p>For detail description see chapter Modbus protocol.</p>			

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ModemIniString

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
In case that your modem needs additional initialization e.g. AT commands, it can be entered here. Otherwise leave this setpoint blank.			

⬅ back to List of setpoints

ModbusComSpeed

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[9600, 19200, 38400, 57600]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
If the Modbus mode is selected on COM1 or COM2 channels, the Modbus communication speed in bps can be adjusted here.			
<p>Note: In case of ModBus/TCP communication via IB-Lite communication module is automatically adjusted COM1 Mode=DIRECT, COM2=MODBUS and ModbusComSpeed=57600. There isn't required any other additional setting (of course except IB-Lite setpoints, see below)</p>			

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IBLite IP Addr

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
IP address of IB-Lite module.			

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IBLite NetMask

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
IB-Lite network mask.			

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IBLite GateIP

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
IP address of gateway for IB-Lite.			

[back to List of setpoints](#)

IBLite DHCP

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[DISABLED, ENABLED]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Dynamic Host Configuration Protocol for IP address setting can be used or blocked.			
DISABLED	Block the function of DHCP, this option is worth, if you wanna adjust stable IP address e.g. for Web Server connection or IntelliMonitor PC tool.		
	Note: <i>Can occurred collision of IP addresses in local network with devices as printer, router etc.!</i>		
ENABLED	Dynamically change IP address of the controller after each switch on of the controller. IP address collision protection. Default state.		

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ComAp Port

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[-]		
Default value		Force value Alternative config	YES
Step			
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is for adjustment of port for ComAp communication over IB-Lite or IL-NT GPRS module. Standard ComAp port is 23, what is default value of this setpoint.			

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APN Name

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Name of APN access point for GPRS network.			
<i>Note: This information shall provide your telecommunication operator.</i>			

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APN UserName

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
User name for APN access point.			
<i>Note: This information shall provide your telecommunication operator.</i>			

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APN UserPass

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
User password for APN access point.			
<i>Note: This information shall provide your telecommunication operator.</i>			

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AirGate

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[DISABLED, ENABLED]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The option allows or blocks the function of AirGate. For AirGate function is necessary to use communication plug-in modules IB-Lite or IL-NT GPRS or InteliDrive Lite partly supports IB-NT too.			
DISABLED Blocks the function of AirGate.			
ENABLED Allows function of AirGate. Default state.			

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AirGate IP

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[-]		
Default value	airgate.comap.cz	Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
AirGate Address. The default address is „airgate.comap.cz“.			
<p>Note: To reduce the data traffic over cellulat network you can set in setpoint group „Comms Settings“ the parameter „AirGate IP“ = 80.95.108.26. This will save significant data amount needed for translation of AirGate server IP address. In case of changing the server IP address this settings has to be updated or returned to default „airgate.comap.cz“.</p>			
<p>IMPORTANT: All manipulations with IL-NT GPRS module has to be done with DC power supply switched off. Module can be only powered while is plugged into the controller and together with controller!</p>			

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SMTP UserName

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
User name or name of e-mail account is used for verification of email sender on SMTP server. If parameter left empty, no verification is expected. It is working for IB-Lite only.			

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SMTP UserPass

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
User password of e-mail account is used for verification of e-mail sender on SMTP server. If parameter left empty, no verification is expected. It is working for IB-Lite only.			

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SMTP Server IP

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjust IP address of SMTP server. It is working for IB-Lite only.			

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Contr MailBox

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
E-mail address used as "Sender" of alarm e-mails from IB-Lite.			
<i>Note: If SMTP server requires verification of sender, e-mail address has to be registered to SMTP server and setpoints "SMTP UserName" and "SMTP UserPass" has to be set to correct values.</i>			

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Time Zone

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
List of time zones used for time reference.			

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DNS IP Address

Setpoint group	Communication Settings	Related FW	2.3.0
Range [units]	[-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This is IP address of Domain Name Server.			

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Group: Engine parameters

Starting RPM

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	5 .. 1500 [RPM]		
Default value	350 RPM	Force value Alternative config	YES
Step	1		
Comm object	9095	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>"Firing" speed when IntelliDrive Lite controller stops cranking (starter goes OFF).</p> <p>Sd Underspeed protection is activated when RPM drops back below the Starting RPM for more than 5 second the engine starting procedure.</p> <p>Note: Limit is ignored when Gear teeth = 0 i.e. in engine operation without speed pickup (running state is indicated from D+ or Starting POil).</p> <p>Note: Can appears during "Cranking state" i.e. Starter (or J1939 Start command) is activated then one running condition was detected (D+ was activated or (POil > Starting POil) condition was filled) - i.e. Starter was switched off based on previous condition and within time (Cranking time and fix 5 s) minimum RPM does not appear (RPM > Starting RPM), then is activated RPM meas fail.</p>			

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Starting POil

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	0.0 .. 100.0 [Bar]		
Default value	4.5	Force value Alternative config	YES
Step	0.1		
Comm object	9681	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Controller stops cranking (starter goes OFF) when Oil Pressure (typically measured on AIN1) is over Starting POil.			
<i>Note: Oil Pressure can be also measured on binary sensor. Then is necessary adjust AIN1 as Binary input and Starting POil=1.</i>			
<i>Note: There are three conditions for stop cranking: Starting RPM (page 113) (just in case the Gear teeth > 0), StartingPOil and D+ (if enabled). Starter goes off when any of these conditions is valid.</i>			

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Prestart time

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	0 .. 600 [s]		
Default value	2	Force value Alternative config	YES
Step	1		
Comm object	8394	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Time of the PRESTART output closed prior to the engine start – i.e. before the binary outputs Fuel solenoid and Starter are closed and opens when Starting RPM speed is reached. Set to zero if you want to leave the output PRESTART opened.			

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Preglow time

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	0 .. 600 [s]		
Default value	0	Force value Alternative config	NO
Step	1		
Comm object	11836	Related applications	N/A
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is used for setting of timer for deactivation of GLOW PLUGS (PAGE 215).			

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PreheatTemp1

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	-600 .. PreheatTemp2 (page 116)[°C]		
Default value	0 °C	Force value Alternative config	NO
Step	1 °C		
Comm object	15985	Related applications	N/A
Config level	Standard		
Setpoint visibility	Always		
Description			
Defines the temperature, at which the LBO Preheat activate of the longest time prior to engine start. See description of PREHEAT (PAGE 203).			

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PreheatTime1

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	0 .. 600 [s]		
Default value	0 s	Force value Alternative config	NO
Step	1 s		
Comm object	15987	Related applications	N/A
Config level	Standard		
Setpoint visibility	Always		
Description			
Defines the shortest time of LBO Preheat activation prior to engine start reached when the measured temperature is PreheatTemp1 (page 115) or higher. See description of PREHEAT (PAGE 203).			

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PreheatTemp2

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	PreheatTemp1 (page 115) .. 600 [°C]		
Default value	0 °C	Force value Alternative config	NO
Step	-		
Comm object	15986	Related applications	N/A
Config level	Standard		
Setpoint visibility	Always		
Description			
Defines the temperature, at which the LBO Preheat activates for the shortest time prior to engine start. See description of PREHEAT (PAGE 203) .			

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PreheatTime2

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	0 .. 600 [s]		
Default value	0 s	Force value Alternative config	NO
Step	-		
Comm object	15988	Related applications	N/A
Config level	Standard		
Setpoint visibility	Always		
Description			
Defines the longest time of the LBO Preheat activation prior to engine start reached when the measured temperature is PreheatTemp2 (page 116) or lower. See description of PREHEAT (PAGE 203) .			

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PreheatSensor

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	OFF/CU: AI1 .. CU: AI9/AIO: AI1 .. AIO: AI4 [-]		
Default value	OFF	Force value Alternative config	NO
Step	-		
Comm object	15989	Related applications	N/A
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is used for selection of analog input, which is used for temperature measurement used for variable preheating time calculation. See description of PREHEAT (PAGE 203) .			

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MaxCrank time

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	1 .. 60 [s]		
Default value	5	Force value Alternative config	YES
Step	1		
Comm object	8256	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is giving maximum time limit of engine cranking.			

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CrnkFail pause

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	5 .. 60 [s]		
Default value	8	Force value Alternative config	YES
Step	1		
Comm object	8257	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Pause between crank (engine start) attempts.			

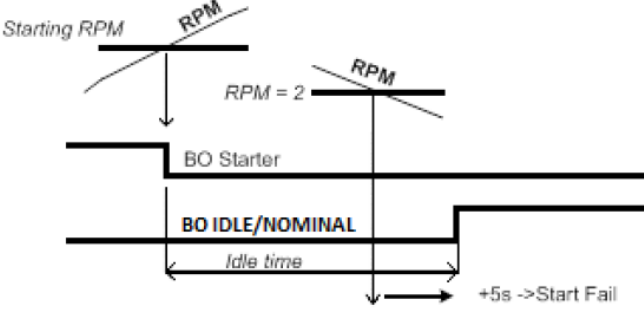
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Crank attempts

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	1 .. 10 [-]		
Default value	3	Force value Alternative config	YES
Step	1		
Comm object	8255	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Maximum number of crank (engine start) attempts.			

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Idle time

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	0 .. 600 [s]		
Default value	12	Force value Alternative config	YES
Step	1		
Comm object	9097	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Idle time delay starts when RPM exceeds Starting RPM (page 113). Start fail is detected when during Idle state RPM decreases below 2.</p> <p>During the Idle time timer running the binary output IDLE/NOMINAL is opened, when it expires the IDLE/NOMINAL output closes. IDLE/NOMINAL (PAGE 204) opens during Cooling period again.</p> <p>Note: Engine can be switched between Idle and Running state by NOMINAL/IDLE (PAGE 195) in MAN mode.</p>			
			

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Idle speed

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	Starting RPM (page 113) .. MinSpeedLim (page 125) [RPM]		
Default value	800	Force value Alternative config	YES
Step	1		
Comm object	9946	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Speed request in engine Idle state i.e. after engine start or when switched to Idle in MAN mode by NOMINAL/IDLE (PAGE 195) and after Engine ShutDown.</p>			

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Cooling speed

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	IDLE, NOMINAL [-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object	10046	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Selects the function of the Binary output IDLE/NOMINAL during engine Cooling state.			
IDLE	Cooling is executed at Idle speed.		
NOMINAL	Cooling is executed at Nominal speed. Default state.		
<i>Note: Binary output IDLE/NOMINAL must be configured and connected to speed governor. Engine Idle speed must be adjusted on speed governor.</i>			

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Cooling time

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	0 .. 3600 [s]		
Default value	30	Force value Alternative config	YES
Step	1		
Comm object	8258	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Run time of the unloaded engine to cool the engine before stop.			

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AfterCool time

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	0 .. 3600 [s]		
Default value	180	Force value Alternative config	YES
Step	1		
Comm object	8662	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Run time of engine after cooling pump. COOLING PUMP (PAGE 204) is closed when the engine starts and opens AfterCool time delayed after engine stops.			

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Stop time

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	0 .. 240 [s]		
Default value	60	Force value Alternative config	YES
Step	1		
Comm object	9815	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Under normal conditions the engine must certainly stop within this period. The period starts by issuing stop command.			
<p>Note: Stop of engine is detected when all following conditions are met: RPM <2, Oil pressure < StartingPOil and D+ input isn't active. Stop fail is detected if there is difference between those conditions.</p>			
<p>Note: In case when stop time period is lower than "stop engine detected" + 10 s, stop time period is extended to this value due to safety reason. (stop engine detected = RPM<2, OilP not detected, D+ not active)</p>			

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Fuel solenoid

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	DIESEL, GAS [-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object	9100	Related applications	

Config level	Standard
Setpoint visibility	Always
Description	
Setpoint setting determines behavior of the Binary output FUEL SOLENOID.	
	Output closes 1 sec before Binary output STARTER.
DIESEL	The output opens if Emergency stop comes or Cooled engine is stopped and in pause between repeated starts.
	In this mode of operation the output closes to open the gas valve and enable the engine to start. The delay of Fuel solenoid output activation in relation to Starter output is defined by FuelSol offset. The output closes only if RPM > 30 (i.e. the starter motor is engaged).
GAS	The output opens if there is any reason to stop the engine or in pause between repeated starts.
<p>Note: In the case of gas engine, the underspeed protection cannot be blocked by the Sprinkler function. For gas engines, it is strongly recommended to use the pick-up sensor, as non-zero RPM detection is required during the start procedure.</p>	

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FuelSol offset

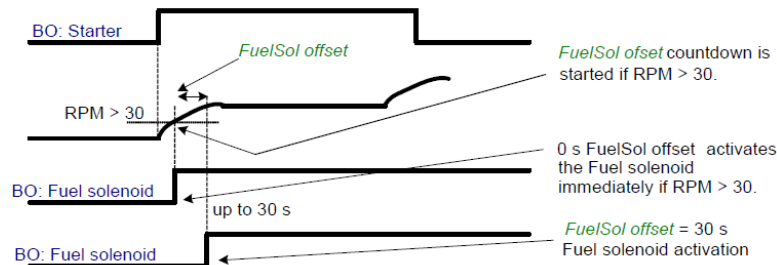
Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	0.0 .. 300.0 [s]		
Default value	0.5	Force value Alternative config	YES
Step	0.1		
Comm object	10525	Related applications	
Config level	Standard		

Setpoint visibility	Always
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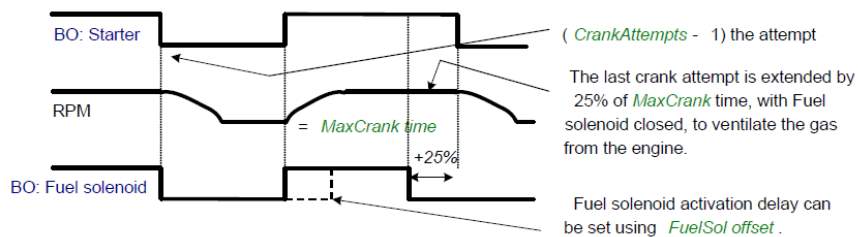
Description

This setpoint adjusts the Fuel solenoid output activation in relation to Starter output when Fuel solenoid = GAS. Setpoint values mean that fuel valve is opened after the Starter. FuelSol offset has effect for both Fuel solenoid = DIESEL or GAS.

Engine starting procedure when **Fuel solenoid (page 120) = GAS**



Note: A new feature has been added which prolongs the last cranking attempt by 25% of MaxCrank time with closed Fuel valve (Fuel Solenoid binary output) in order to ventilate the remaining gas, as is implemented in IG/IS-NT. This function is valid only when **Fuel solenoid (page 120) = GAS**



Note: Is modified functionality of the Ignition binary output. The Ignition binary output will close 1 second (fixed value) after activation of binary output Fuel solenoid (when Fuel solenoid = GAS setting is active). Generally, the output closes after reaching value of CrankRPM = 30RPM (fixed value). The output opens after stopping of the engine or during crank fail pauses among crank attempts.

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D+ function

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	ENABLED, CHRGFALL, DISABLED [-]		
Default value	DISABLED	Force value Alternative config	YES
Step	-		
Comm object	9683	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
ENABLED	The D+ terminal is used for both functions - “running engine” detection and charge fail detection.		
CHRGFALL	The D+ terminal is used for charge fail detection only.		
DISABLED	The D+ terminal is not used. Default state.		
<p>Note: The magnetization current is provided independently on this setpoint value. The D+ charge fail protection becomes active after Idle time (page 118) reaches zero.</p>			

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ECU Control

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	ENABLED, DISABLED [-]		
Default value	ENABLED	Force value Alternative config	YES
Step	-		
Comm object	11086	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The setpoint enables adjustment of the electronic engine control by following settings.			
ENABLED	There is a full available control of an electronic engine given by the setting of the ECU unit of the engine, i.e. Start request, Stop request, Speed request are enabled if available. Default state.		
DISABLED	Control of an electronic engine is fully blocked and the IntelliDrive Lite can only monitor the values of an electronic engine.		

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ECU SpeedAdj

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	MinSpeedLim (page 125) .. MaxSpeedLim (page 126) [RPM]		
Default value	1500	Force value Alternative config	YES
Step	1		
Comm object	13095	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Enables to adjust engine speed in ECU via CAN bus. Speed request value after the Idle time is over and no other speed selection is activated.</p> <p>Speed request in % range is calculated using the setpoints 0%ofSpeedReq (page 129) and 100%ofSpeedReq (page 129).</p> <p>Note: See <i>Speed request chart (page 61)</i>.</p>			

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RetToSpeedAdj

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	DISABLED, ENABLED [-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object	11838	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Selection among SPEED SEL1 (PAGE 196), SPEED SEL2 (PAGE 196), SPEED SEL3 (PAGE 196) behavior.</p> <p>DISABLED Speed request is set by LBI Speed Sel1, 2, 3 (see appropriate setpoints) by rising edge (button, no switch) - i.e. Speed request stay constant after the input is opened and can be changed by SPEED UP (PAGE 195) and SPEED DOWN (PAGE 195). Default state.</p> <p>ENABLED Speed request goes to ECU SpeedAdj when the LBI Speed Sel1, 2, 3 are opened. Speed request can be changed by SPEED UP (PAGE 195) and SPEED DOWN (PAGE 195) when LBI Speed Sel1, 2, 3 are closed.</p> <p>Note: See <i>Speed request chart (page 61)</i>.</p>			

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ReliefVal time

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	0 .. 3600 [s]		
Default value	30	Force value Alternative config	NO
Step	1		
Comm object	10612	Related applications	N/A
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is used to set duration of time for which LBO ReliefValActiv will be activated.			

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MinSpeedLim

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	Starting RPM (page 113) .. MaxSpeedLim (page 126) [RPM]		
Default value	1200	Force value Alternative config	YES
Step	1		
Comm object	10096	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The setpoint presets the minimum engine speed in the “Running” operation state. Also see other conditions in the chapter below.			
Note: See <i>Speed request chart (page 61)</i> .			

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MaxSpeedLim

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	MinSpeedLim (page 125) .. 4000 [RPM]		
Default value	2700	Force value Alternative config	YES
Step	1		
Comm object	10097	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The setpoint presets the maximum engine speed in the “Running” operation state. Also see other conditions in the chapter below.			
<i>Note: See Speed request chart (page 61).</i>			

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BI Speed Sel 1

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	MinSpeedLim (page 125) .. MaxSpeedLim (page 126) [RPM]		
Default value	1250	Force value Alternative config	YES
Step	1		
Comm object	10099	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The setpoint presets the required engine speed during the ‘Speed Sel 1’ binary input is active. Function depends on RetToSpeedAdj setting.			
<i>Note: See Speed request chart (page 61).</i>			

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BI Speed Sel 2

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	MinSpeedLim (page 125) .. MaxSpeedLim (page 126) [RPM]		
Default value	1300	Force value Alternative config	YES
Step	1		
Comm object	10523	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The setpoint presets the required engine speed during the 'Speed Sel 2' binary input is active. Function depends on RetToSpeedAdj (page 124) setting.			
<i>Note: See Speed request chart (page 61).</i>			

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BI Speed Sel 3

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	MinSpeedLim (page 125) .. MaxSpeedLim (page 126) [RPM]		
Default value	1450	Force value Alternative config	YES
Step	1		
Comm object	10524	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The setpoint presets the required engine speed during the 'Speed Sel 3' binary input is active. Function depends on RetToSpeedAdj (page 124) setting.			
<i>Note: When none of the binary inputs: 'Speed Sel1', 'Speed Sel2' and 'Speed Sel3', 'Speed Up' and 'Speed Down' has not been configured then engine speed is given by the ECU SpeedAdj (page 124) setpoint.</i>			
<i>Note: See Speed request chart (page 61).</i>			

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Speed Ramp

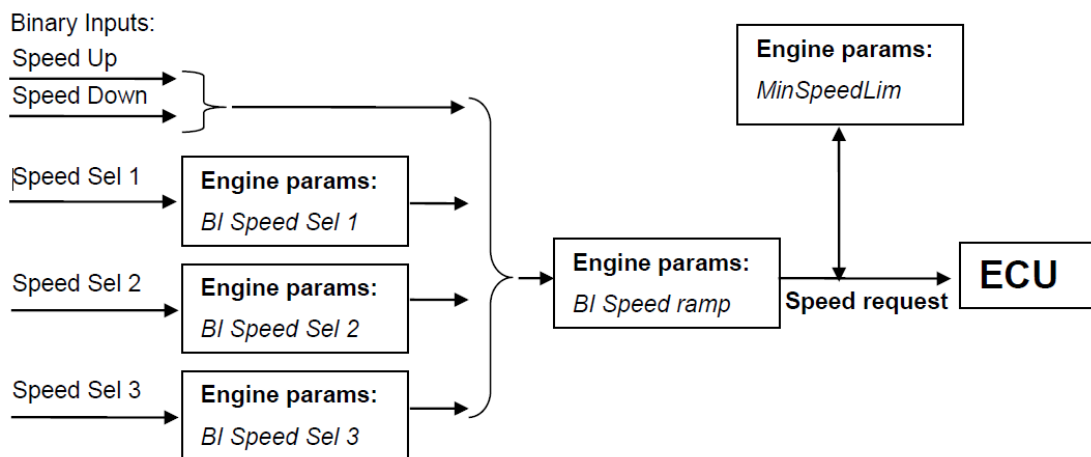
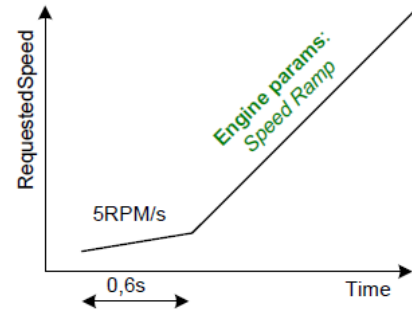
Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	1 .. MaxSpeedLim (page 126) [RPM/s]		
Default value	50	Force value Alternative config	YES
Step	1		
Comm object	10148	Related applications	

Config level	Standard
Setpoint visibility	Always

Description

Any Speed request change is done via this Ramp function. The Ramp via Binary SpeedUp and SpeedDown inputs is dual rate, see below.

The Binary inputs SpeedUp and SpeedDown ramp function is for the 0.6s constant 5RPM/s. Does not depend on Engine params: Speed Ramp setting. This enables fine setting of Engine speed to specific value e.g. 1500 RPM.



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0%ofSpeedReq

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	0 .. 3000 [RPM]		
Default value	0	Force value Alternative config	YES
Step	1		
Comm object	11125	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Limit for Speed Request transformation from RPM to % range for ECU engines using % format.			
<p>Example: If ECU is configured, then on one of the measurement screen you can see two lines SpeedReq Abs and SpeedReq Rel.</p> <p>In default setting: 0 RPM = 0 % 800 RPM = 33.3 % 2400 RPM = 100 %</p> <p>Different setting: 800 RPM = 0 % 1200 RPM = 33.3 % 2400 RPM = 100 %</p>			
It is possible easily configure own output curve and use it for analog output Speed Request.			

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100%ofSpeedReq

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	0 .. 4000 [RPM]		
Default value	2000	Force value Alternative config	YES
Step	1		
Comm object	11126	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Limit for Speed Request transformation from RPM to % range for ECU engines using % format.			

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Conveyor horn

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	0 .. 600 [s]		
Default value	7	Force value Alternative config	YES
Step	1		
Comm object	11835	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Horn time before the conveyor output starts.			

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Running timer

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	0 .. 1000 [min]		
Default value	0	Force value Alternative config	YES
Step	1		
Comm object	11837	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Automatic engine stop in MAN mode or delayed engine stop in AUT mode. Start engine in MAN mode by START button. Engine stops itself after Running Timer is over. Engine stays running when Running timer (page 130) = 0			

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FuelTankVolume

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	0 .. 10000 [L]		
Default value	200	Force value Alternative config	YES
Step	1		
Comm object	11103	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is describing volume of fuel tank for counting fuel consumption depending on Fuel level drop.			

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MaxFuelDrop

Setpoint group	Engine parameters	Related FW	2.3.0
Range [units]	0 .. 50 [%/h]		
Default value	25	Force value Alternative config	YES
Step	1		
Comm object	12373	Related applications	
Config level	Standard		
Setpoint visibility	Always		

Description

This is setting protection against the fuel leakage or theft.

Function monitors the AIN3 Fuel level value in percentage scale without decimals. The alarm and history record "Wrm FuelTheft" is activated when Fuel level change is faster than setpoint limit. Function is switched off when Max Fuel Drop = 0 %/h.

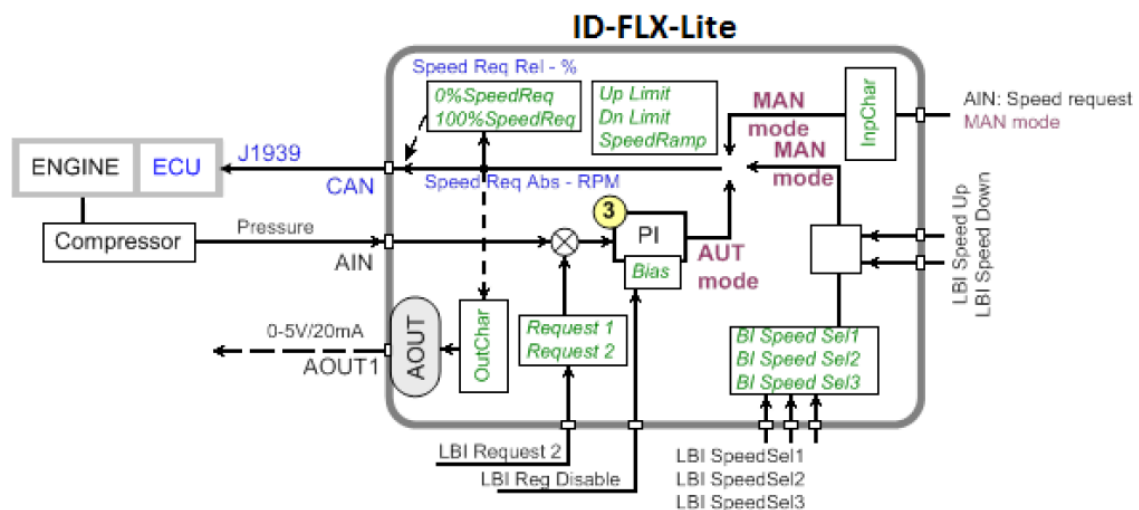
The drop out limit on stopped engine is 5% to avoid unwanted Alarm activation due to AIN3: Fuel level fluctuations.

Active alarm "Wrm FuelTheft" can be sent via SMS and displayed by WebSupervisor (if used).

Note: Set 0 to disable Fuel Theft Protection function into MaxFuelDrop setpoint.

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Group: Regulator



LAI SpdRequest

Setpoint group	Regulator	Related FW	2.3.0
Range [units]	OFF, CU:AI1, CU:AI2, CU:AI3, CU:AI4, CU:AI5, CU:AI6, CU:AI7, CU:AI8, CU:AI9, AIO:IA1, AIO:AI2, AIO:AI3, AIO:AI4 [-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object	11842	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Setpoint is determined for selection of analog input for Speed request in the controller's MAN mode.			
OFF Speed request selection is done by binary inputs. Default state.			
CU: AI1-CU: AI9 Speed request via analog input of the controller only. Binary inputs are ignored.			
AIO :1-AIO4 Speed request via analog input of extension module IL-NT-AIO only. Binary inputs are ignored.			
<i>Note: Analog speed request is ignored in AUT mode.</i>			
<i>Note: See Speed request chart (page 61).</i>			

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Reg Input

Setpoint group	Regulator	Related FW	2.3.0
Range [units]	CU:AI1, CU:AI2, CU:AI3, CU:AI4, CU:AI5, CU:AI6, CU:AI7, CU:AI8, CU:AI9, AIO:IA1, AIO:AI2, AIO:AI3, AIO:AI4, RPM-BI3 [-]		
Default value	CU:AI1	Force value Alternative config	YES
Step	-		
Comm object	11843	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
PI loop analog input selection. Source can be adjusted from controller analog inputs or from extension module inputs. It is also possible to use Binary input 3 in function of RPM detection. The Speed request (regulator output) is assigned to Reg Bias value in the case of selected analog input sensor fail.			

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Reg Bias

Setpoint group	Regulator	Related FW	2.3.0
Range [units]	0 .. 10000 [-]		
Default value	0	Force value Alternative config	YES
Step	1		
Comm object	11848	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Constant PI regulator output when the LBI R Reg Disable = closed.			

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Request 1

Setpoint group	Regulator	Related FW	2.3.0
Range [units]	-10000 .. +10000 [-]		
Default value	0	Force value Alternative config	YES
Step	1		
Comm object	11844	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Regulator requested value.			

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Request 2

Setpoint group	Regulator	Related FW	2.3.0
Range [units]	-10000 .. +10000 [-]		
Default value	0	Force value Alternative config	YES
Step	1		
Comm object	11845	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Regulator requested value when LBI Request2 is active.			

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Reg Gain

Setpoint group	Regulator	Related FW	2.3.0
Range [units]	-2000.0 .. +2000.0 [%]		
Default value	10	Force value Alternative config	YES
Step	0.1		
Comm object	11846	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is giving regulator gain factor. See Note below.			

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Reg Integral

Setpoint group	Regulator	Related FW	2.3.0
Range [units]	0.0 .. 1000.0 [%]		
Default value		Force value Alternative config	YES
Step	0.1		
Comm object	11847	Related applications	
Config level	Standard		

Setpoint visibility Always

Description

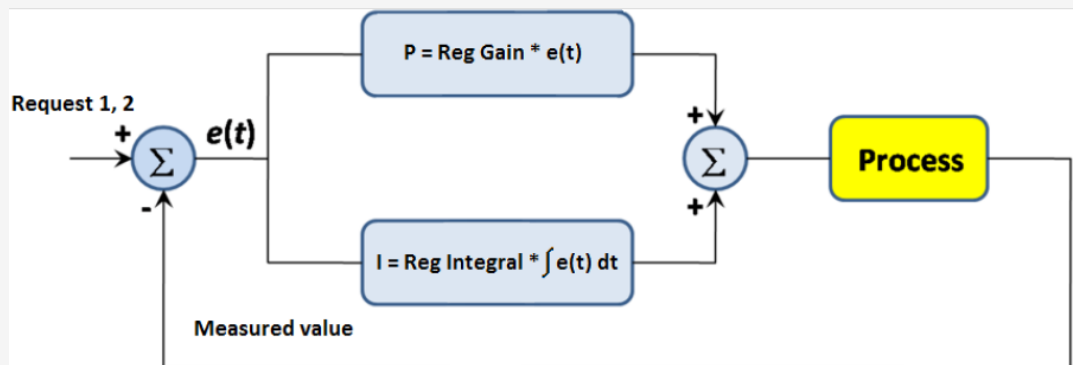
This setpoint is giving regulator integration factor. See Note below.

Note: IntelliDrive Lite controllers include PI loop for speed or analog output regulation. The requested value is given by setpoints **Request 1 (page 133)** and **Request 2 (page 133)**. This loop is working like Proportional-Integral regulation with setpoints **Reg Gain (page 134)** and **Reg Integral** for each part and these parts affect each other.

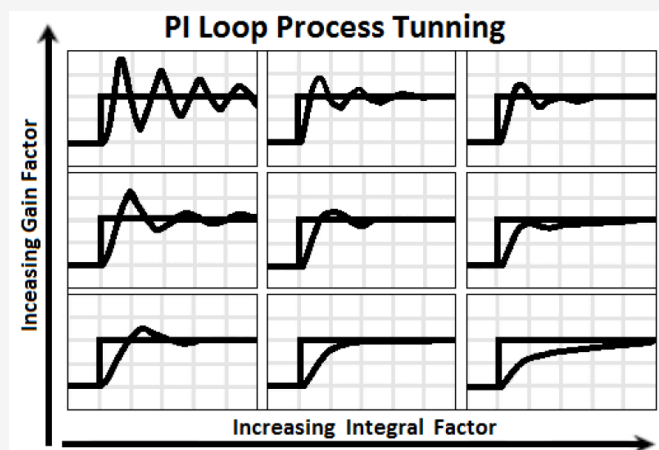
The controller output is given by:

$$\text{Reg Gain} * e(t) + \text{Reg Integral} * \int e(t) dt,$$

where $e(t)$ is deviation of actual value $e(t) = \text{Request 1, 2} - \text{Measured value}$.



Here are two tuning parameters that can be adjusted **Reg Gain** and **Reg Integral**. These parameters interact each other, see the graphic below. Picture shows how differences in Gain and Integral can affect PI loop's responsiveness. The central pic is as base case with fast change with minimum oscillations to required level. Upper left graph shows high gain and low integral values, what produce large oscillation with slow smoothing. Opposite case is on the lower right graph, which shows low gain and high integral values. The response of the system is sluggish.



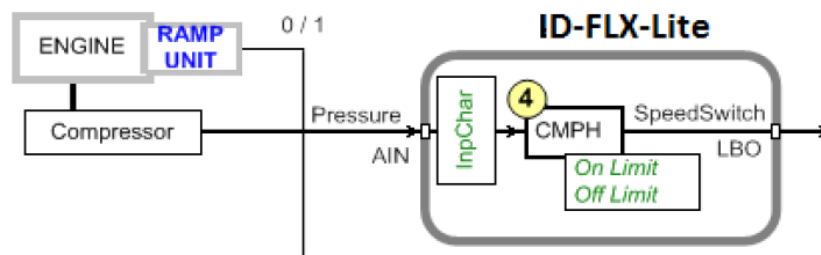
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Reg CMP Input

Setpoint group	Regulator	Related FW	2.3.0
Range [units]	CU:AI1, CU:AI2, CU:AI3, CU:AI4, CU:AI5, CU:AI6, CU:AI7, CU:AI8, CU:AI9, AIO:IA1, AIO:AI2, AIO:AI3, AIO:AI4, RPM-BI3 [-]		
Default value	CU:AI1	Force value Alternative config	YES
Step	-		
Comm object	11839	Related applications	
Config level	Standard		
Setpoint visibility	Always		

Description

This is comparator with hysteresis analog input selection from controller analog inputs or from extension module inputs. It is also possible to use Binary input 3 in function of RPM detection.



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Reg CMP On

Setpoint group	Regulator	Related FW	2.3.0
Range [units]	-10000 .. +10000 [-]		
Default value	0	Force value Alternative config	YES
Step	1		
Comm object	11841	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Limit to close SPEEDSWITCH (PAGE 216).			

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Reg CMP Off

Setpoint group	Regulator	Related FW	2.3.0
Range [units]	-10000 .. +10000 [-]		
Default value	0	Force value Alternative config	YES
Step	1		
Comm object	11840	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Limit to open the SPEEDSWITCH (PAGE 216) .			

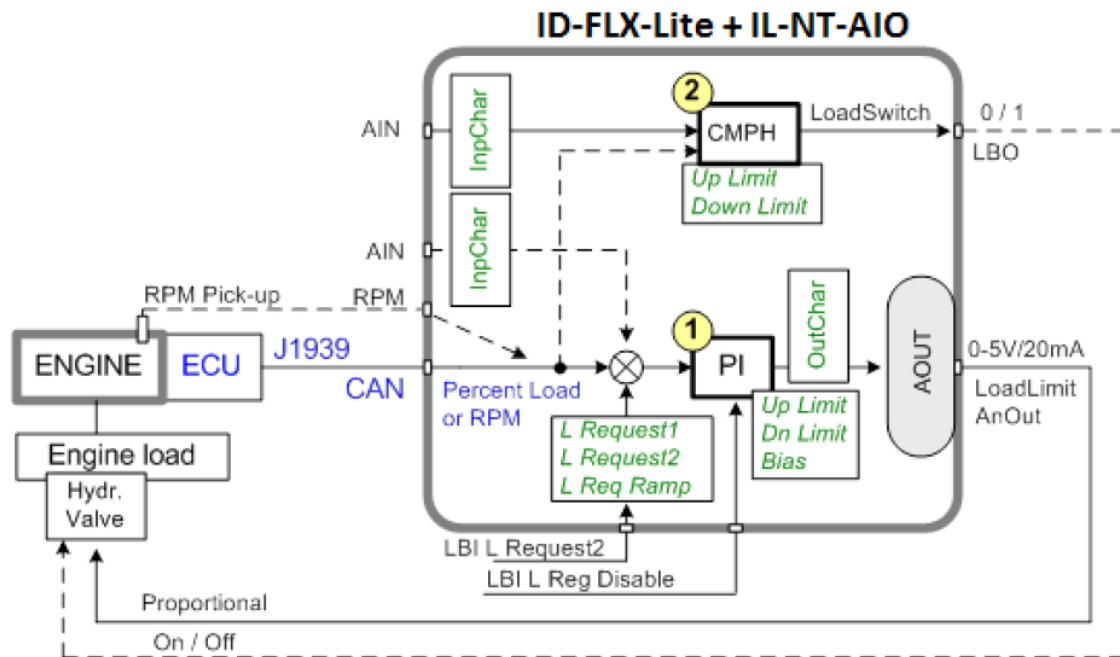
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AUT SpdReq

Setpoint group	Regulator	Related FW	2.3.0
Range [units]	Reg Bias, LBi SpdUp/Dwn, CU AI1-CU AI9, AIO: AI1 - 4 [-]		
Default value	Reg Bias	Force value Alternative config	YES
Step	-		
Comm object	13068	Related applications	N/A
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>The setpoint is used for selecting what regulation will be used in AUTO mode in case automatic regulation is disabled by R REG DISABLE (PAGE 198) Disable. The options are:</p> <ul style="list-style-type: none"> ▶ Reg Bias – speed request will be set according to Reg Bias (page 133), this function was standard functionality of R Reg disable LBI in previous FW versions. ▶ SPEED UP (PAGE 195) / SPEED DOWN (PAGE 195) – it is possible to regulate speed manually by Speed Up (page 195) / Speed Down (page 195) even in Auto mode. ▶ CU AI1-CU AI9, AIO: AI1 - 4 – it is possible to regulate speed manually by analog inputs even in Auto mode <p>Note: See <i>Speed request chart (page 61)</i>.</p>			

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Group: Load limit



Load input

Setpoint group	Load limit	Related FW	2.3.0
Range [units]	RPM, ECU:Load, CU:AI1, CU:AI2, CU:AI3, CU:AI4, CU:AI5, CU:AI6, CU:AI7, CU:AI8, CU:AI9, AIO:IA1, AIO:AI2, AIO:AI3, AIO:AI4 [-]		
Default value	RPM	Force value Alternative config	YES
Step	-		
Comm object	11850	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description	This setpoint is for Load limit PI loop analog input selection. Source can be adjusted from controller RPM pick-up, ECU, analog inputs or from extension module inputs.		

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Load Bias

Setpoint group	Load limit	Related FW	2.3.0
Range [units]	0 .. 10000 [-]		
Default value	0	Force value Alternative config	YES
Step	1		
Comm object	11851	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Constant Load limit PI regulator output. Load Bias is activated when: <ul style="list-style-type: none"> ▶ Engine Sd protection is activated ▶ LOADREGDISABLE (PAGE 197) = closed ▶ Load input value is invalid (Sensor Fail) 			

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LoadRequest 1

Setpoint group	Load limit	Related FW	2.3.0
Range [units]	-10000 .. +10000 [-]		
Default value	80	Force value Alternative config	YES
Step	1		
Comm object	11852	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Regulator requested value.			

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Load request 2

Setpoint group	Load limit	Related FW	2.3.0
Range [units]	-10000 .. +10000 [-]		
Default value	80	Force value Alternative config	YES
Step	1		
Comm object	11853	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Regulator requested value when LOADREQUEST2 (PAGE 197) is active.			

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LoadReq Ramp

Setpoint group	Load limit	Related FW	2.3.0
Range [units]	1 .. 10000 [1/s]		
Default value	1000	Force value Alternative config	YES
Step	1		
Comm object	11854	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Ramp when is switched between LoadRequest 1 (page 139) and Load request 2 (page 139).			

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LoadUpLimit

Setpoint group	Load limit	Related FW	2.3.0
Range [units]	0 .. 10000 [-]		
Default value	10000	Force value Alternative config	YES
Step	1		
Comm object	11855	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Load limit regulator PI output upper limit.			

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LoadDnLimit

Setpoint group	Load limit	Related FW	2.3.0
Range [units]	0 .. 10000 [-]		
Default value	0	Force value Alternative config	YES
Step	1		
Comm object	11856	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Load limit regulator PI output low limit.			

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Load Gain

Setpoint group	Load limit	Related FW	2.3.0
Range [units]	-200.0 .. +200.0 [%]		
Default value	0	Force value Alternative config	YES
Step	0.1		
Comm object	11857	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This is setpoint is giving Load limit gain factor.			

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Load Integral

Setpoint group	Load limit	Related FW	2.3.0
Range [units]	0.0 .. 100.0 [%]		
Default value	0	Force value Alternative config	YES
Step	0.1		
Comm object	11858	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is giving Load limit integration factor.			

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Load CMP Input

Setpoint group	Load limit	Related FW	2.3.0
Range [units]	RPM, ECU:Load, CU:AI1, CU:AI2, CU:AI3, CU:AI4, CU:AI5, CU:AI6, CU:AI7, CU:AI8, CU:AI9, AIO:IA1, AIO:AI2, AIO:AI3, AIO:AI4 [-]		
Default value	RPM	Force value Alternative config	YES
Step	-		
Comm object	11859	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is for Load limit comparetor with hysteresis analog input selection. Source can be adjusted from controller RPM pick-up, ECU, analog inputs or from extension module inputs.			

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Load CMP Off

Setpoint group	Load limit	Related FW	2.3.0
Range [units]	-10000 .. +10000 [-]		
Default value	95	Force value Alternative config	YES
Step	1		
Comm object	11860	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Limit to close LOADSWITCH (PAGE 216).			

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Load CMP On

Setpoint group	Load limit	Related FW	2.3.0
Range [units]	-10000 .. +10000 [-]		
Default value	90	Force value Alternative config	YES
Step	1		
Comm object	11861	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Limit to open LOADSWITCH (PAGE 216).			

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Group: Engine protection

Eng prot del

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 300 [s]		
Default value	5	Force value Alternative config	YES
Step	1		
Comm object	8262	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
During the start of the engine, some engine protections have to be blocked (e.g. Oil pressure). The protections are unblocked after the Protection del time. The time starts after reaching Start RPM.			

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BIN6 delay

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 300 [s]		
Default value	1	Force value Alternative config	YES
Step	1		
Comm object	10131	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Specific protection delay is possible to use on Binary Input 6. Delay is active for Wm or Sd protection only – not for functions like Rem Start/Stop. Protection delay is active for both Binary input NO / NC configuration. BIN6 del starts after Eng prot del (page 142) when BI6 protection is configured “Running only”.</p>			

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Horn timeout

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 600 [s]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	8264	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Max time limit of horn sounding. Set to zero if you want to leave the output HORN open. Horn timeout starts again from the beginning if a new alarm appears before previous Horn timeout has elapsed.</p>			

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StartOverspeed

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	50 .. 150 [%]		
Default value	120	Force value Alternative config	YES
Step	1		
Comm object	13340	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Limit for engine ShutDown overspeed protection. Protection is active during start process of the engine and Idle time.			
<p><i>Note: The engine can spasmodically reach higher than Overspeed (page 144) level during start, but for normal running state would be this protection too high. This setpoint allows the overspeed protection during irregular starting condition.</i></p>			

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Overspeed

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	50 .. 150 [%]		
Default value	115	Force value Alternative config	YES
Step	1 % of Nominal RPM (page 96)		
Comm object	8263	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Limit for engine ShutDown overspeed protection.			

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Underspeed

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	Starting RPM (page 113) .. 100 [%]		
Default value	25	Force value Alternative config	YES
Step	1 % of Nominal RPM (page 96)		
Comm object	8260	Related applications	
Config level	Standard		

Setpoint visibility	Always
Description	
<p>Limit for Warning Underspeed protection. Active protection is indicated as “Wm Underspeed” in Alarm list. Under speed Warning protection is inactive 5 s after RPM is over Starting RPM (page 113) and during the Idle time.</p> <p>The READY TO LOAD (PAGE 206) is deactivated when Wm underspeed protection is active and needs the Fault reset for activation after RPM is over Underspeed limit.</p>	
<p>The diagram illustrates the engine's RPM over time. It shows three horizontal lines representing different protection levels: 'Engine protect: Underspeed Warning level' (top), 'Engine params: Starting RPM Shut-down level' (middle), and a lower level for 'Sd Underspeed'. The RPM curve starts below the starting level, rises above it, then falls below it. A 5-second interval is marked from the point where RPM crosses the starting level down to the point where it crosses the warning level. Protection states 'Wm Underspeed' and 'Sd Underspeed' are indicated as active during the low-RPM period. Time intervals for 'Engine params: Idle time' and 'Engine protect: Eng prot del' are also shown.</p>	

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Flow SwitchDel

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 600 [s]		
Default value	5	Force value Alternative config	YES
Step	1		
Comm object	12620	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
<p>Engine is switched to Cooling state when Binary input FlowSwitch is not closed within Flow SwitchDel after „Running“ (Ready to load) engine state activation.</p>			

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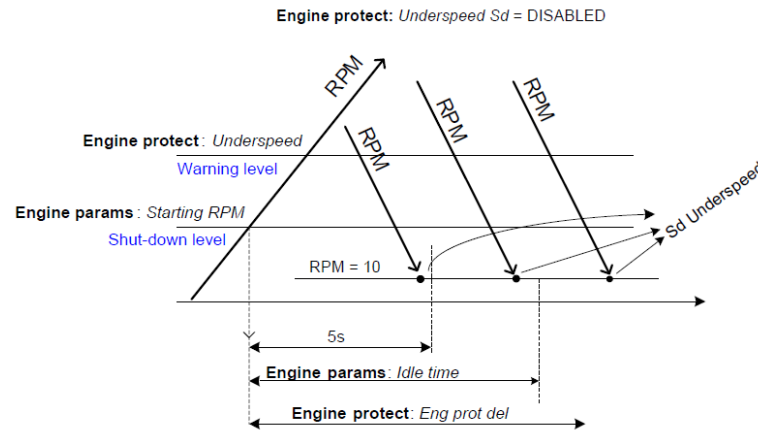
UnderspeedSd

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	DISABLED, ENABLED [-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object	11415	Related applications	
Config level	Standard		

Setpoint visibility	Always
----------------------------	--------

Description

DISABLED	Disables the Wrn Underspeed protection when engine RPM drops below Underspeed (page 144) and SdUnderspeed protection in case the engine RPM drops below the Starting RPM (page 113) .
ENABLED	Function as on the picture above. Default state.



Tables below describe Underspeed protection behavior depends on Underspeed Sd setpoint setting and RPM value.

UnderspeedSd (page 1) = ENABLED

RPM <	Engine State	AlarmList	History	ReadyToLoad
Underspeed (page 144)	Idle	-	-	Off
	Running	Wrn Underspeed	-	On -> Off
Starting RPM (page 113)	Idle	Sd Underspeed	Sd Underspeed	Off
	Running	Sd Underspeed	Sd Underspeed	Off

UnderspeedSd (page 1) = ENABLED

RPM <	Engine State	AlarmList	History	ReadyToLoad
Underspeed (page 144)	Idle	-	-	Off
	Running	-	-	On
Starting RPM (page 113)	Idle	-	-	Off
	Running	-	-	On
10 RPM	Idle	Sd Underspeed	Sd Underspeed	On -> Off
10 RPM	Running	Wrn Undersped Sd Underspeed	Sd Underspeed	On -> Off

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AIN1 Level 1

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	-100.0 .. +1000.0 [Bar]		
Default value	2.0	Force value Alternative config	YES
Step	0.1		
Comm object	8369	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Warning limit level for ANALOG INPUT 1.			

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AIN1 Level 2

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	-100.0 .. +1000.0 [Bar]		
Default value	1.0	Force value Alternative config	YES
Step	0.1		
Comm object	8370	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Shutdown limit level for ANALOG INPUT 1.			

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AIN1 Del

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 180 [s]		
Default value	3	Force value Alternative config	YES
Step	1		
Comm object	8365	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for ANALOG INPUT 1.			
<p><i>Note: Analog input 1 is usually determined to Oil Pressure measurement and it is resistive type of input with range 0-2500 Ω.</i></p>			

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AIN2 Level 1

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	-100 .. 10000 [°C]		
Default value	80	Force value Alternative config	YES
Step	1		
Comm object	8375	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Warning limit level for ANALOG INPUT 2.			

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AIN2 Level 2

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	-100 .. 10000 [°C]		
Default value	90	Force value Alternative config	YES
Step	1		
Comm object	8376	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Shutdown limit level for ANALOG INPUT 2.			

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AIN2 Del

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 180 [s]		
Default value	5	Force value Alternative config	YES
Step	1		
Comm object	8371	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for ANALOG INPUT 2 alarm.			
<p>Note: Analog input 2 is usually determined to Engine Temperature measurement and it is resistive type of input with range 0-2500 Ω.</p>			

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AIN3 Level 1

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	-100 .. +10000 [%]		
Default value	20	Force value Alternative config	YES
Step	1		
Comm object	8381	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Warning limit level for ANALOG INPUT 3.			

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AIN3 Level 2

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	-100 .. 10000 [%]		
Default value	10	Force value Alternative config	YES
Step	10		
Comm object	8382	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Shutdown limit level for ANALOG INPUT 3.			

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AIN3 Del

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 180 [s]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	8377	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for ANALOG INPUT 3.			
<p><i>Note: Analog input 3 is usually determined to Fuel Level measurement and it is resistive type of input with range 0-2500 Ω.</i></p>			

🔍 back to List of setpoints

Batt overvolt

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	Batt undervolt (page 150) .. 40.0 [V]		
Default value	36.0	Force value Alternative config	YES
Step	0.1		
Comm object	9587	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High battery voltage Warning limit.			

[back to List of setpoints](#)

Batt undervolt

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	80.0 .. Batt overvolt (page 150) [-]		
Default value	18.0	Force value Alternative config	YES
Step	0.1		
Comm object	8387	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low battery voltage Warning limit.			

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Batt volt del

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 600 [s]		
Default value	5	Force value Alternative config	YES
Step	1		
Comm object	8383	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for low and high battery voltage alarm.			

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AIN4 Level 2

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U16]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	9272	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Shutdown limit level for AIN4.			

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AIN4 Del

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 3600 [s]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	9273	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for Wrm/Sd AIN4 alarm.			

[back to List of setpoints](#)

AIN4 Eval

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	NORMAL, CLASS C [-]		
Default value	NORMAL	Force value Alternative config	YES
Step	-		
Comm object	13372	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
NORMAL	Protection behaves according to the standard configuration of Wrn/Sd alarm in LiteEdit AINx configuration screen. Default state.		
CLASS C	The protection is type "Running only" and does not depend on Running only tick in LiteEdit AINx Alarm properties configuration window. Protection (Class C) is working after AINx Del or sooner when appropriate value increases over AINx Wrn limit +3 seconds – after engine start. Warning/ShutdDown protection is activated with fix delay 0.5 s.		
<p>Note: Class C protection is working and corresponding setpoints are visible only when corresponding AIN is configured in Modify->Alarm properties-> Direction-> Window prot.</p>			

🔍 back to List of setpoints

AIN4 LowWrn

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U16]		
Default value	20	Force value Alternative config	YES
Step	1		
Comm object	13365	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low Warning limit level for AIN4.			

🔍 back to List of setpoints

AIN4 LowSd

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U16]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	13366	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low ShutDown limit level for AIN4.			

[back to List of setpoints](#)

AIN4 LowDel

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 3600 [s]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	13367	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low level protection delay for Wrn and Sd of AIN4.			

[back to List of setpoints](#)

AIN4 HighWrn

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U16]		
Default value	20	Force value Alternative config	YES
Step	1		
Comm object	13368	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High Warning limit level for AIN4.			

[back to List of setpoints](#)

AIN4 HighSd

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U16]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	13369	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High ShutDown limit level for AIN4.			

🔍 back to List of setpoints

AIN4 HighDel

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 3600 [s]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	13370	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High level protection delay for Wm and Sd of AIN4.			
<i>Note: Analog input 4 is fully configurable and it is voltage type of input with range 0-40 V.</i>			

🔍 back to List of setpoints

AIN5 Level 1

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000[U17]		
Default value	20	Force value Alternative config	YES
Step	1		
Comm object	9274	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Warning limit level for AIN5.			

🔍 back to List of setpoints

AIN5 Level 2

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U17]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	9275	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Shutdown limit level for AIN5.			

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AIN5 Del

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 3600 [s]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	9276	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for Wrm/Sd AIN5 alarm.			

[back to List of setpoints](#)

AIN5 Eval

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	NORMAL, CLASS C [-]		
Default value	NORMAL	Force value Alternative config	YES
Step	-		
Comm object	13373	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
NORMAL	Protection behaves according to the standard configuration of Wrn/Sd alarm in LiteEdit AINx configuration screen. Default state.		
CLASS C	The protection is type "Running only" and does not depend on Running only tick in LiteEdit AINx Alarm properties configuration window. Protection (Class C) is working after AINx Del or sooner when appropriate value increases over AINx Wrn limit +3 seconds - after engine start. Warning/ShutdDown protection is activated with fix delay 0.5 s.		
<p>Note: Class C protection is working and corresponding setpoints are visible only when corresponding AIN is configured in Modify->Alarm properties-> Direction-> Window prot.</p>			

🔍 back to List of setpoints

AIN5 LowWrn

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U17]		
Default value	20	Force value Alternative config	YES
Step	1		
Comm object	13353	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low Warning limit level for AIN5.			

🔍 back to List of setpoints

AIN5 LowSd

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U17]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	13354	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low ShutDown limit level for AIN5.			

[back to List of setpoints](#)

AIN5 LowDel

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 3600 [s]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	13355	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low level protection delay for Wrn and Sd of AIN5.			

[back to List of setpoints](#)

AIN5 HighWrn

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U17]		
Default value	20	Force value Alternative config	YES
Step	1		
Comm object	13356	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High Warning limit level for AIN5.			

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AIN5 HighSd

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U17]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	13357	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High ShutDown limit level for AIN5.			

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AIN5 HighDel

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 3600 [s]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	13358	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High level protection delay for Wm and Sd of AIN5.			
<i>Note: Analog input 5 is fully configurable and it is voltage type of input with range 0-40 V.</i>			

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AIN6 Level 1

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U12]		
Default value	20	Force value Alternative config	YES
Step	1		
Comm object	9259	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Warning limit level for AIN6.			

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AIN6 Level 2

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [-]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	9260	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Shutdown limit level for AIN6.			

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AIN6 Del

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 3600 [s]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	9261	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for Wrm/Sd AIN6 alarm.			

[back to List of setpoints](#)

AIN6 Eval

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	NORMAL, CLASS C [-]		
Default value	NORMAL	Force value Alternative config	YES
Step	-		
Comm object	13076	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
NORMAL	Protection behaves according to the standard configuration of Wrn/Sd alarm in LiteEdit AINx configuration screen. Default state.		
CLASS C	The protection is type "Running only" and does not depend on Running only tick in LiteEdit AINx Alarm properties configuration window. Protection (Class C) is working after AINx Del or sooner when appropriate value increases over AINx Wrn limit +3 seconds - after engine start. Warning/ShutdDown protection is activated with fix delay 0.5 s.		
<p>Note: Class C protection is working and corresponding setpoints are visible only when corresponding AIN is configured in Modify->Alarm properties-> Direction-> Window prot.</p>			

🔍 back to List of setpoints

AIN6 LowWrn

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U12]		
Default value	20	Force value Alternative config	YES
Step	1		
Comm object	13359	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low Warning limit level for AIN6.			

🔍 back to List of setpoints

AIN6 LowSd

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 ... 10000 [U12]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	13360	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low ShutDown limit level for AIN6.			

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AIN6 LowDel

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 3600 [s]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	13361	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low level protection delay for Wrn and Sd of AIN6.			

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AIN6 HighWrn

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U12]		
Default value	20	Force value Alternative config	YES
Step	1		
Comm object	13350	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High Warning limit level for AIN6.			

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AIN6 HighSd

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U12]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	13351	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High ShutDown limit level for AIN6.			

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AIN6 HighDel

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 3600 [s]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	13352	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High level protection delay for Wm and Sd of AIN6			
<i>Note: Analog input 6 is fully configurable and it is voltage type of input with range 0-10 V.</i>			

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AIN7 Level 1

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U13]		
Default value	20	Force value Alternative config	YES
Step	1		
Comm object	9262	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Warning limit level for AIN7.			

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AIN7 Level 2

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U14]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	9265	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			

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AIN7 Del

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 3600 [s]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	9264	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for Wm/Sd AIN7 alarm.			

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AIN7 Eval

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	NORMAL, CLASS C [-]		
Default value	NORMAL	Force value Alternative config	YES
Step	-		
Comm object	13077	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
NORMAL	Protection behaves according to the standard configuration of Wrn/Sd alarm in LiteEdit AINx configuration screen. Default state.		
CLASS C	The protection is type "Running only" and does not depend on Running only tick in LiteEdit AINx Alarm properties configuration window. Protection (Class C) is working after AINx Del or sooner when appropriate value increases over AINx Wrn limit +3 seconds - after engine start. Warning/ShutdDown protection is activated with fix delay 0.5 s.		
<p>Note: Class C protection is working and corresponding setpoints are visible only when corresponding AIN is configured in Modify->Alarm properties-> Direction-> Window prot.</p>			

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AIN7 LowWrn

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U13]		
Default value	20	Force value Alternative config	YES
Step	1		
Comm object	13362	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low Warning limit level for AIN7.			

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AIN7 LowSd

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U13]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	13363	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low ShutDown limit level for AIN7.			

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AIN7 LowDel

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 3600 [s]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	13364	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Low level protection delay for Wrn and Sd of AIN7.			

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AIN7 HighWrn

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U13]		
Default value	20	Force value Alternative config	YES
Step	1		
Comm object	13347	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High Warning limit level for AIN7.			

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AIN7 HighSd

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [-]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	13348	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High ShutDown limit level for AIN7.			

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AIN7 HighDel

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 3600 [s]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	13349	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
High level protection delay for Wm and Sd of AIN7.			
<i>Note: In the alarm list is only displayed Wm/Sd alarm on the appropriate analog input. There is not resolution Low/High alarm.</i>			
<i>Note: Analog input 7 is fully configurable and it is voltage type of input with range 0-10 V.</i>			

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AIN8 Level 1

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U14]		
Default value	20	Force value Alternative config	YES
Step	1		
Comm object	9265	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Warning limit level for AIN8.			

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AIN8 Level 2

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U14]		
Default value	20	Force value Alternative config	YES
Step	1		
Comm object	9266	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Shutdown limit level for AIN8.			

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AIN8 Del

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 180 [s]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	9267	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for Wrm/Sd AIN8 alarm.			
<p>Note: Analog input 8 is configurable with basic two levels protection and it is voltage type of input with range 0-10 V.</p>			

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AIN9 Level 1

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U15]		
Default value	20	Force value Alternative config	YES
Step	1		
Comm object	9268	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Warning limit level for AIN9.			

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AIN9 Level 2

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 10000 [U15]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	9269	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Shutdown limit level for AIN9.			

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AIN9 Del

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 180 [s]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	9270	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for Wm/Sd AIN9 alarm.			
<p>Note: Analog input 9 is configurable with basic two levels protection and it is voltage type of input with range 0-10 V.</p>			

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NextServTime

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 65535 [h]		
Default value	10000	Force value Alternative config	YES
Step	1		
Comm object	9648	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Counting down when engine is running. Service time alarm appears if reaches zero. By setting the value of 65535 h the count down is disabled.			
<i>Note: Set the NextServTime = 65535 h to disable count down. The setpoint stays constant, but Statistics value (visible in LiteEdit) displays ##### invalid value.</i>			

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GearBoxRatio

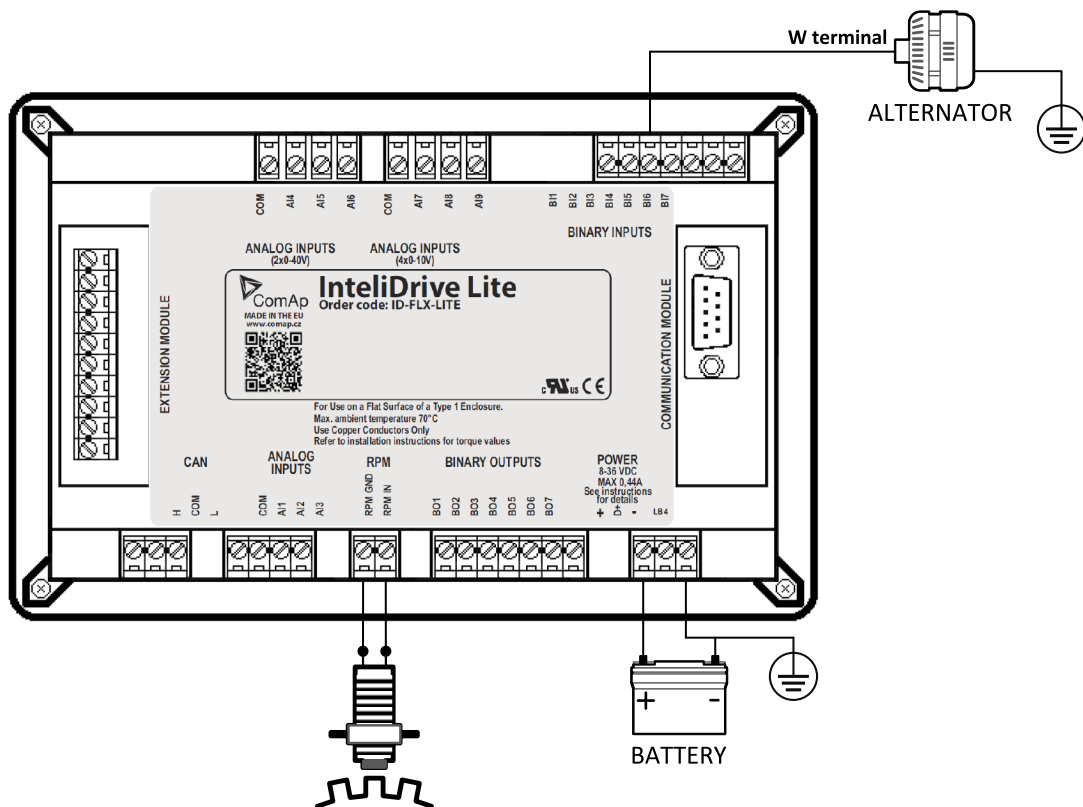
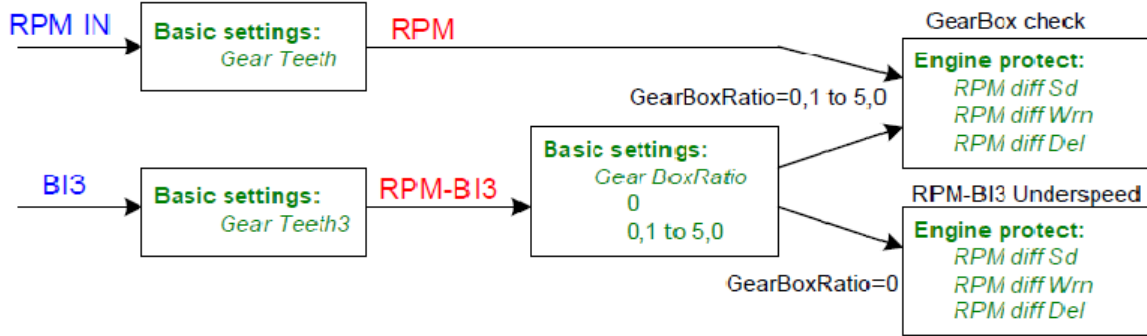
Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0.0 .. 5.0 [RPM]		
Default value	0.0	Force value Alternative config	YES
Step	0.1		
Comm object	8708	Related applications	
Config level	Standard		

Setpoint visibility Always

Description

There are two new protections related to RPM-BI3 where functions **RPMdiff Sd** (page 171), **RPMdiff Wrn** (page 172) limits depends on setting of GearBoxRatio:

- ▶ Separate RPM-BI3 underspeed Wrn and Sd protection when Engine protect: GearBoxRatio = 0.0
- ▶ Difference check between RPM and RPM3 with calculation of gear-box ratio, when Engine protect: GearBoxRatio > 0.0. Protection is active when engine is **READY TO LOAD** (PAGE 206).



Note: The RPM-BI3 measuring and corresponding protections are switched off when **GearTeethBI3** (page 96) = 0. In this case BI3 operates as standard Binary input.

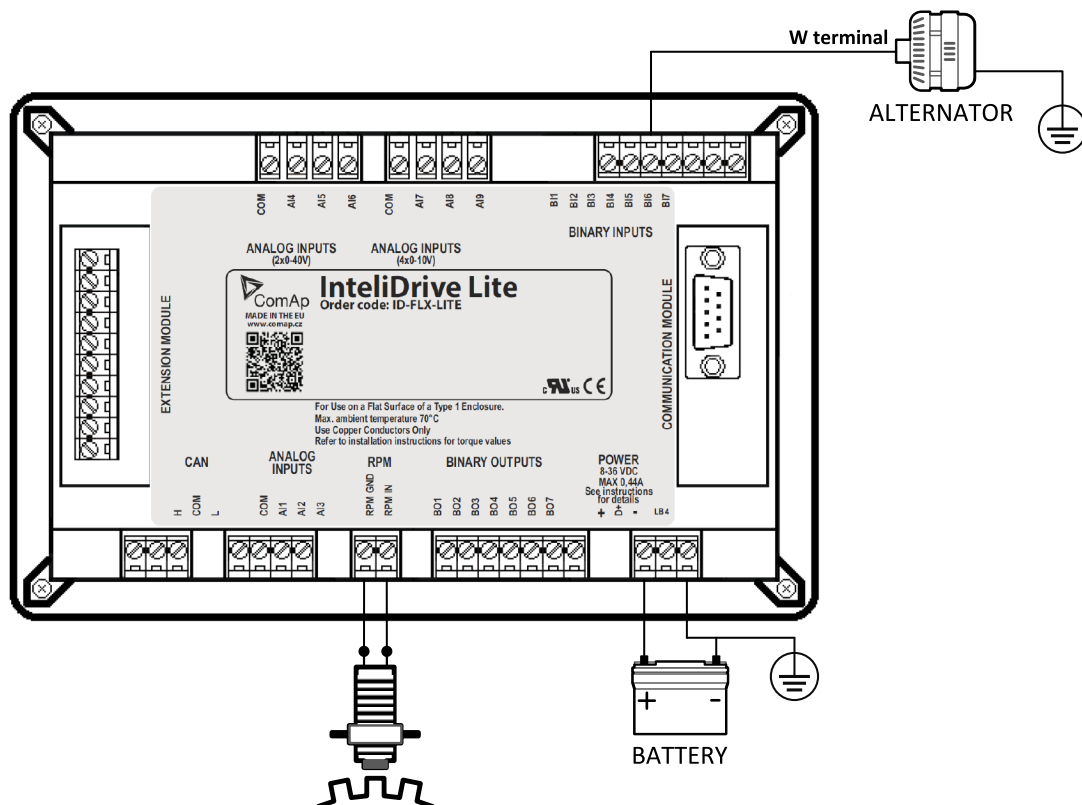
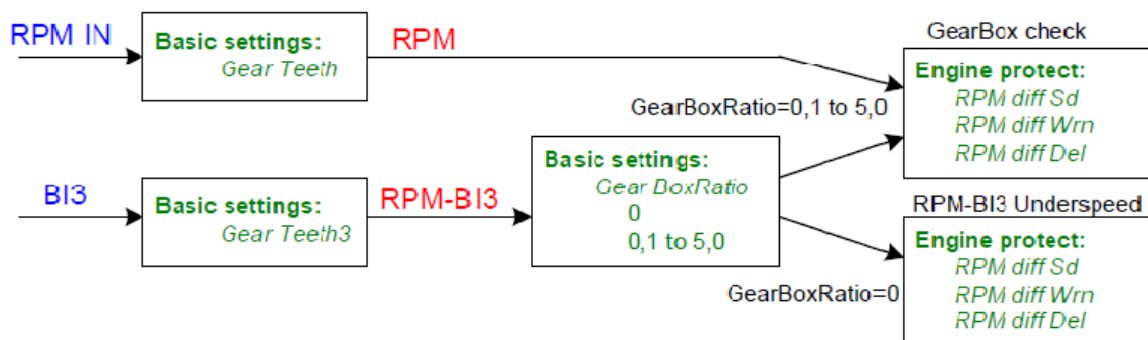
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RPMdiff Sd

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	1 .. 1000 [RPM]		
Default value	1000	Force value Alternative config	YES
Step	1		
Comm object	10143	Related applications	
Config level	Standard		
Setpoint visibility	Always		

Description

RPM-BI3 Sd underspeed protection limit or Sd difference limit between RPM-BI3 and RPM transferred via GearBoxRatio (page 169).



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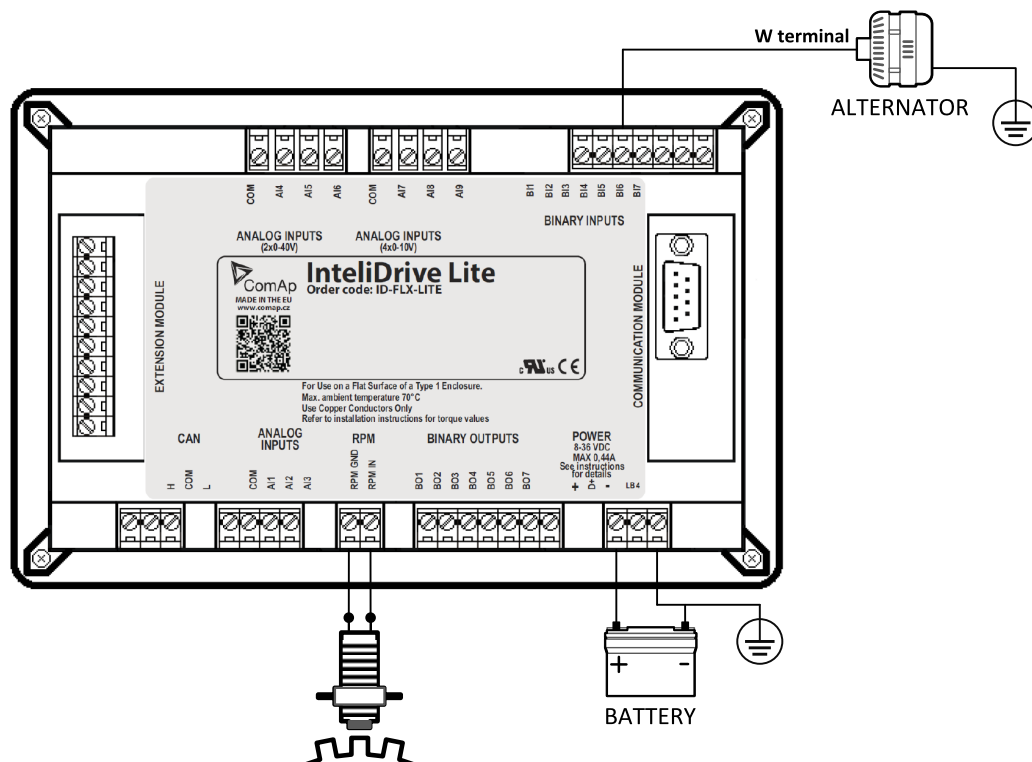
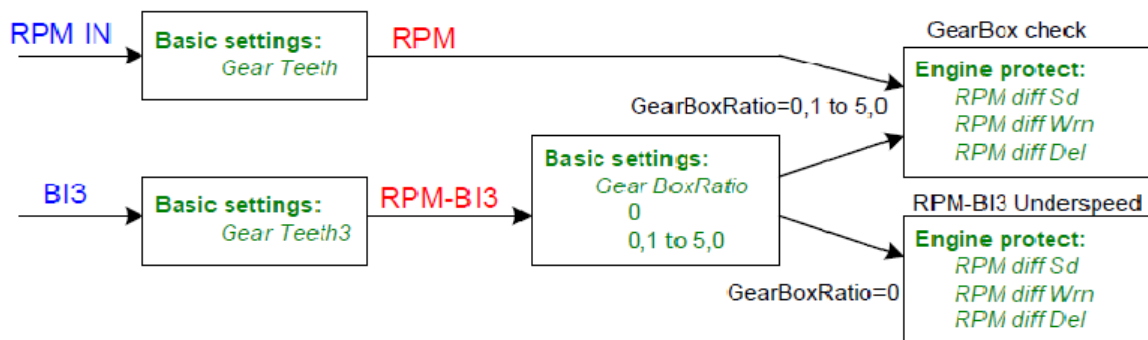
RPMdiff Wrn

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	1 .. 1000 [RPM]		
Default value	1000	Force value Alternative config	YES
Step	1		
Comm object	10141	Related applications	
Config level	Standard		
Setpoint visibility	Always		

Description

RPM-BI3 Wrn underspeed protection limit or Wrn difference limit between RPM-BI3 and RPM transferred via **GearBoxRatio** (page 169). See description in **GearBoxRatio** (page 169). In alarm list appears text Wrn RPMdiff.

Message: Wrn RPMdiff



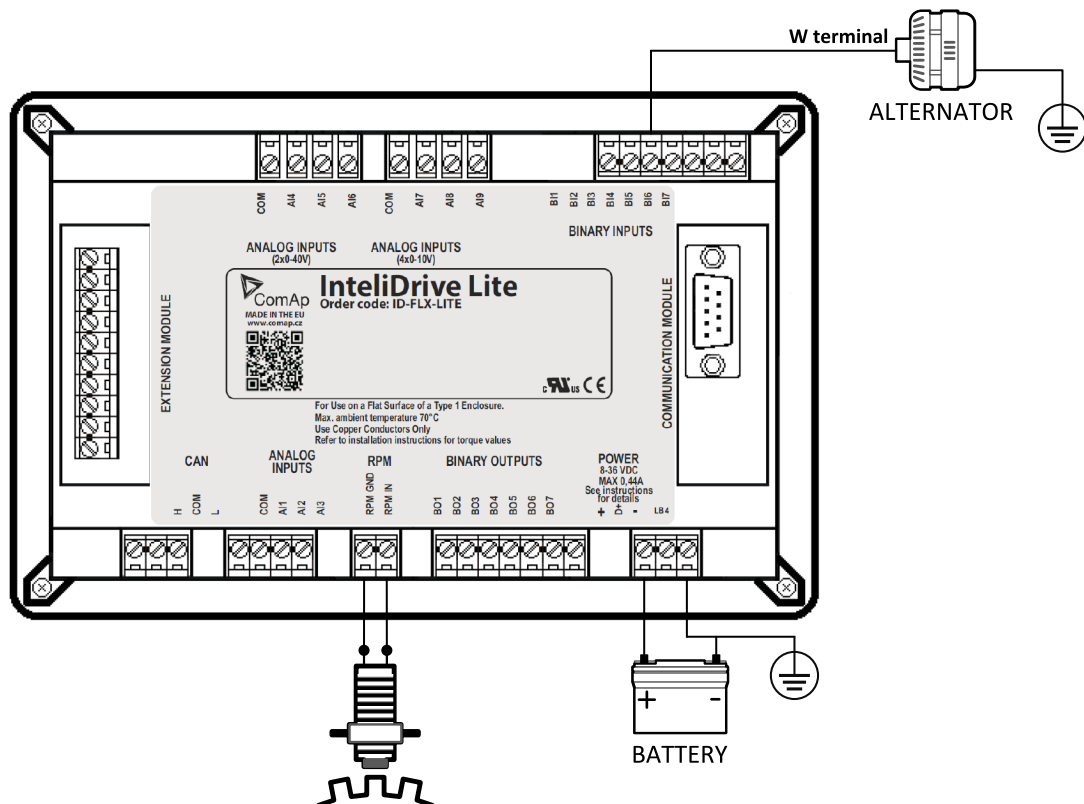
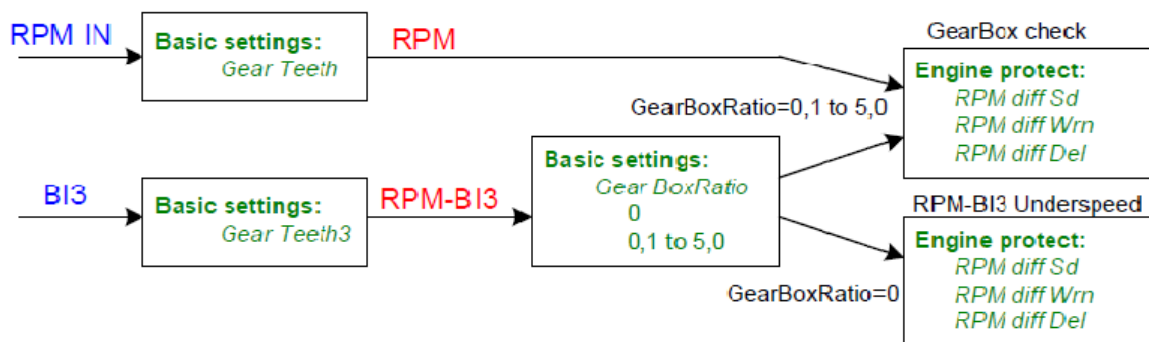
[back to List of setpoints](#)

RPMdiff delay

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 600 [s]		
Default value	5	Force value Alternative config	YES
Step	1		
Comm object	10150	Related applications	
Config level	Standard		
Setpoint visibility	Always		

Description

Delay for RPMdiff protections above. See description in **GearBoxRatio** (page 169).



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BIN1 Prot Del...BIN7 Prot Del

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 3600 [s]		
Default value	0	Force value Alternative config	YES
Step	1		
Comm object	13078	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Seven setpoints are dedicated for separately adjustment of the delay for each of binary inputs according to the Class B protection standard.			
<i>Note: The corresponding BIN protection has to be configured as Running only in LiteEdit.</i>			

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DEF Level Min

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 150 [%]		
Default value	10	Force value Alternative config	YES
Step	1		
Comm object	13178	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Diesel Exhaust Fluid level protection activates DEF TANK LEVEL (PAGE 212) when received level (J1939 - SCR - Selective Catalytic Reduction message) is below DEF Level Min for more than (fix) 3 s delay. This function is active for IVECO NEF&&Cursor engine. LBO can be active for running engine only.			

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DEF Level Max

Setpoint group	Engine protection	Related FW	2.3.0
Range [units]	0 .. 150 [%]		
Default value	90	Force value Alternative config	YES
Step	1		
Comm object	13379	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Diesel Exhaust Fluid level protection deactivates DEF TANK LEVEL (PAGE 212) when received level (J1939 - SCR - Selective Catalytic Reduction message) is above DEF Level Max for more than (fix) 3 s delay. This function is active for IVECO NEF&&Cursor engine.			
<i>Note: DEF Level is usual signage of Urea tank level, which is more often used in United States.</i>			

[back to List of setpoints](#)

Group: Date/Time

Time stamp per

Setpoint group	Date/Time	Related FW	2.3.0
Range [units]	0 .. 240 [min]		
Default value	60	Force value Alternative config	YES
Step	1		
Comm object	8979	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint is dedicated to adjustment of time interval for periodical history records.			

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SummerTimeMod

Setpoint group	Date/Time	Related FW	2.3.0
Range [units]	DISABLED, WINTER, SUMMER, WINTER-S, SUMMER-S [-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object	8727	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
DISABLED	Automatic switching between summer and wintertime is disabled.		
WINTER (SUMMER)	Automatic switching between summer and winter time is enabled and it is set to winter (summer) season.		
WINTER-S (SUMMER-S)	Modification for southern hemisphere.		

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Time

Setpoint group	Date/Time	Related FW	2.3.0
Range [units]	[HH:MM:SS]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Actual time.			

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Date

Setpoint group	Date/Time	Related FW	2.3.0
Range [units]	[DD:MM:YYYY]		
Default value		Force value Alternative config	YES
Step	-		
Comm object		Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Actual date.			

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Timer1Function

Setpoint group	Date/Time	Related FW	2.3.0
Range [units]	NoFunc, AutoRun, AutoRegCMP, AutoBatt, AutoStop [-]		
Default value	No Func	Force value Alternative config	YES
Step	-		
Comm object	11660	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
No Func	Operates just corresponding TIMER1 (PAGE 214) according the TIMER1 (PAGE 214) setting, see Timer1repeat (page 178) , Timer1 ON time (page 178) , Timer1Duration (page 179) . Function operates in all OFF-MAN-AUT modes. Default state.		
AutoRun	Engine automatically starts and stops in AUT mode (similar to REM START/STOP (PAGE 192) , the same record in the history) according the TIMER1 (PAGE 214) setting.		
AutoRegCMP	Start and stop engine in AUT mode according to the SPEEDSWITCH (PAGE 216) - see Reg CMP Input (page 136) . The comparator function (output) works opposite when Reg CMP On (page 136) < Reg CMP Off . The Timer1repeat (page 178) , Timer1 ON time (page 178) , Timer1Duration (page 179) settings are not important in this case.		
AutoBatt	Engine starts when actual Battery voltage < Batt undervolt (page 150) + Batt volt del (page 150) and stays running for Timer1Duration (page 179) . Function operates in AUT mode.		
AutoStop	Engine is switched from AUT to MAN and stopped or stopped from MAN mode (like by STOP button) when engine runs longer then Timer1Duration (page 179) on actual RPM less or equal Idle speed (page 118) + 5 % (fix limit) . Function is not active during engine start.		

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Timer1repeat

Setpoint group	Date/Time	Related FW	2.3.0
Range [units]	NONE, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, WEDNESDAY, FRIDAY, SATURDAY, SUNDAY, MON-FRI, MON-SAT, MON-SUN, SAT-SUN [-]		
Default value	NONE	Force value Alternative config	YES
Step	-		
Comm object	10045	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint defines TIMER1 (PAGE 214) activation. TIMER1 (PAGE 214) is internally linked with REM START/STOP (PAGE 192) . Refer to binary inputs for details.			
NONE		Timer function is disabled. Default state.	
MONDAY, TUESDAY, WEDNESDAY, THURSDAY, WEDNESDAY, FRIDAY, SATURDAY, SUNDAY		Timer is activated on daily basis.	
MON-FRI, MON-SAT, SAT-SUN		Timer is activated on selected day interval.	

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Timer1 ON time

Setpoint group	Date/Time	Related FW	2.3.0
Range [units]	[HH:MM:SS]		
Default value		Force value Alternative config	YES
Step	-		
Comm object	10042	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Display day time when Timer 1 output is activated.			

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Timer1Duration

Setpoint group	Date/Time	Related FW	2.3.0
Range [units]	1 .. 1440 [min]		
Default value	5	Force value Alternative config	YES
Step	1		
Comm object	10044	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjusts duration of Timer 1 output.			

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Timer2Function

Setpoint group	Date/Time	Related FW	2.3.0
Range [units]	No Func, AutoRun, AutoRegCMP, AutoBatt, AutoStop [-]		
Default value	No Func	Force value Alternative config	YES
Step	-		
Comm object	11661	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
No Func	Operates just corresponding TIMER2 (PAGE 215) according the TIMER2 (PAGE 215) setting, see Timer2repeat (page 180) , Timer2 ON time (page 180) , Timer2Duration (page 181) . Function operates in all OFF-MAN-AUT modes. Default state.		
AutoRun	Engine automatically starts and stops in AUT mode (similar to REM START/STOP (PAGE 192) , the same record in the history) according the TIMER2 (PAGE 215) setting.		
AutoRegCMP	Start and stop engine in AUT mode according to the SPEEDSWITCH (PAGE 216) - see Reg CMP Input (page 136) . The comparator function (output) works opposite when Reg CMP On (page 136) < Reg CMP Off (page 137) . The Timer2repeat (page 180) , Timer2 ON time (page 180) , Timer2Duration (page 181) are not important in this case.		
AutoBatt	Engine starts when actual Battery voltage < Batt undervolt (page 150) + Batt volt del (page 150) and stays running for Timer2Duration (page 181) . Function operates in AUT mode.		
AutoStop	Engine is switched from AUT to MAN and stopped or stopped from MAN mode (like by STOP button) when engine runs longer then Timer2Duration (page 181) on actual RPM less or equal Idle speed (page 118) + 5% (fix limit) . Function is not active during engine start.		

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Timer2repeat

Setpoint group	Date/Time	Related FW	2.3.0
Range [units]	NONE, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, WEDNESDAY, FRIDAY, SATURDAY, SUNDAY, MON-FRI, MON-SAT, MON-SUN, SAT-SUN [-]		
Default value	NONE	Force value Alternative config	YES
Step	-		
Comm object	10202	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
This setpoint defines TIMER2 (PAGE 215) activation. TIMER2 (PAGE 215) is internally linked with REM START/STOP (PAGE 192) . Refer to binary inputs for details.			
NONE		Timer function is disabled. Default state.	
MONDAY, TUESDAY, WEDNESDAY, THURSDAY, WEDNESDAY, FRIDAY, SATURDAY, SUNDAY		Timer is activated on daily basis.	
MON-FRI, MON-SAT, SAT-SUN		Timer is activated on selected day interval.	

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Timer2 ON time

Setpoint group	Date/Time	Related FW	2.3.0
Range [units]	[HH:MM:SS]		
Default value		Force value Alternative config	YES
Step	-		
Comm object	10199	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Display day time when Timer 2 output is activated.			

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Timer2Duration

Setpoint group	Date/Time	Related FW	2.3.0
Range [units]	1 .. 1440 [min]		
Default value	5	Force value Alternative config	YES
Step	1		
Comm object	10201	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Adjusts duration of Timer 2 output.			

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Group: Sensors Spec

Calibr AI1, AI2, AI3, AI4, AI5, AI6, AI7, AI8, AI9

Setpoint group	Sensors Spec	Related FW	2.3.0
Range [units]	-1000 .. +1000 [-]		
Default value	0	Force value Alternative config	YES
Step	1		
Comm object	11916	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Calibrate the constant to adjust the measured value of IntelliDrive Lite analog inputs. Physical dimension of calibrating constant is corresponding to Analog input.			
Note: Calibration constants have to be adjusted when measured value is near the alarm level.			

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Calibr AIO1, AIO2, AIO3, AIO4

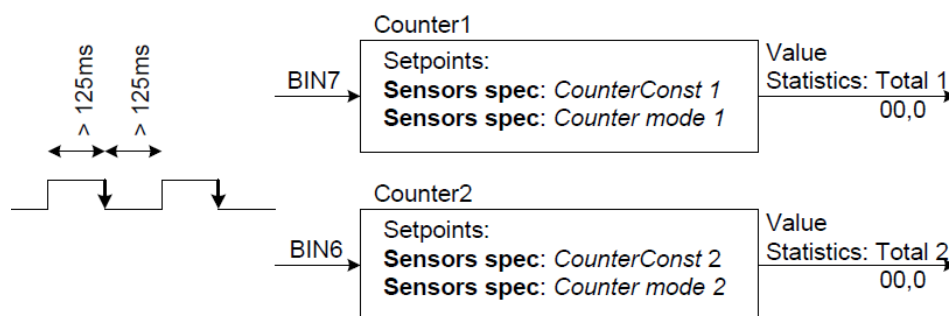
Setpoint group	Sensors Spec	Related FW	2.3.0
Range [units]	-1000 .. +1000 [-]		
Default value	0	Force value Alternative config	YES
Step	1		
Comm object	11919	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Calibrate the constant to adjust the measured value of plug-in analog inputs. Physical dimension of calibrating constant is corresponding to Analog input.			

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CounterConst 1, CounterConst 2

Setpoint group	Sensors Spec	Related FW	2.3.0
Range [units]	0.01 .. 655.34 [-]		
Default value	1.00	Force value Alternative config	YES
Step	0.01		
Comm object	14281	Related applications	
Config level	Standard		
Setpoint visibility	Always		

Description



Counter 1 (fix linked to Binary physical input 7) and Counter 2 (fix linked to Binary physical input 6) counts pulses (falling edges). The counters function depends on Counter mode 1 and ... 2 setting and does not depend on BIN6, BIN7 inputs configuration. The maximal input frequency is limited up to 4 Hz – i.e. the shortest input pulse is 125 ms and gap 125 ms (not shorter) to be each edge counted.

CounterConst 1, CounterConst 2 is conversion (multiplication) factor between number of counted pulses (edges) and output Statistics values Total 1 and Total 2. Values stay in memory even if controller is switched off. Both can be cleared or adjusted in LiteEdit like other Statistics values when level 3 password is set.

The Statistics value Total 1 and Total 2 range see in table below.

Note: The number of controller screen characters is limited – i.e. displays ?????? when steps over range. Both counters starts from again zero when reach maximum.

Statistics value	Screen	From	To	Over
Total 1 or Total 2	Controller	0.0	9999999.9	?????????
	LiteEdit		429496729.4	Continue from 0.0

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Counter mode 1, Counter mode 2

Setpoint group	Sensors Spec	Related FW	2.3.0
Range [units]	[Always / Running / OFF]		
Default value	OFF	Force value Alternative config	YES
Step	-		
Comm object	14283	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Setting of Counter 1 and Counter 2 mode:			
Always	Corresponding counter counts pulses all time.		
Running	Corresponding counter counts pulses only when engine is running.		
OFF	Corresponding counter does not count pulses. Default settings.		
<p>Note: The Total 1 and Total 2 values are visible in LiteEdit – Values – Statistics. The Total 1 and Total 2 values disappear from controller screen when both Counter modes 1 and 2 are switched OFF otherwise there is new screen between existing Statistics and Alarm list.</p>			

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Group: AIO module

AnInAIO1, AIO2, AIO3, AIO4 lev1

Setpoint group	AIO module	Related FW	2.3.0
Range [units]	-100 .. 10000 [-]		
Default value	0	Force value Alternative config	YES
Step	1		
Comm object	13650	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The level for il-nt plug-in card Analog input 1, 2, 3, 4 alarm detection.			

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AnInAIO1, AIO2, AIO3, AIO4 lev2

Setpoint group	AIO module	Related FW	2.3.0
Range [units]	-100 .. 10000 [-]		
Default value	0	Force value Alternative config	YES
Step	1		
Comm object	13654	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
The level for IL-NT-AIO plug-in card Analog input 1, 2, 3, 4 alarm detection.			

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AnInAIO1, AIO2, AIO3, AIO4 del

Setpoint group	AIO module	Related FW	2.3.0										
Range [units]	0 .. 180 [s]												
Default value	5	Force value Alternative config	YES										
Step	1												
Comm object	13658	Related applications											
Config level	Standard												
Setpoint visibility	Always												
Description													
<table border="1"> <thead> <tr> <th>Configuration</th> <th>Protection</th> </tr> </thead> <tbody> <tr> <td>Under limit</td> <td>Protection is activated only when measured value is under measured level.</td> </tr> <tr> <td>Over limit</td> <td>Protection is activated only when measured value is over measured level.</td> </tr> <tr> <td>UnderLimit+fIs</td> <td>Level 2 protection is activated by sensor fail too.</td> </tr> <tr> <td>OverLimit+fIs</td> <td>Level 2 protection is activated by sensor fail too.</td> </tr> </tbody> </table>				Configuration	Protection	Under limit	Protection is activated only when measured value is under measured level.	Over limit	Protection is activated only when measured value is over measured level.	UnderLimit+fIs	Level 2 protection is activated by sensor fail too.	OverLimit+fIs	Level 2 protection is activated by sensor fail too.
Configuration	Protection												
Under limit	Protection is activated only when measured value is under measured level.												
Over limit	Protection is activated only when measured value is over measured level.												
UnderLimit+fIs	Level 2 protection is activated by sensor fail too.												
OverLimit+fIs	Level 2 protection is activated by sensor fail too.												
Note: Plug-in analog inputs protection alarms can be configured following way.													

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Group: Act. Calls/SMS

Note: If a cellular network modem and/or internet bridge is connected to the controller, the controller can send SMS messages and/or emails in the moment when a new alarm appears in the Alarm list. The message will contain a copy of the Alarm list.

To enable this function, you should select with setpoints *Yel Alarm Msg* and *Red Alarm Msg*, which levels of alarms shall be announced (red/yellow/both) and also enter valid cellular network phone number and/or e-mail address to the setpoints *TelNo/Addr Ch1* and *TelNo/Addr Ch2*. It is possible to put either number or e-mail to both setpoints.

Note: An internet module must be available for sending of e-mails. Similarly, a cellular network modem is necessary for sending of SMS.

Note: There are 5 attempts for any active call (SMS/E-Mail). Timeout for connection is 90 sec and after 120 sec controller starts the next attempt. During the time the IL-NT GPRS is trying to send an active call type, incoming calls are blocked.

Yel Alarm Msg

Setpoint group	Act. Calls/SMS	Related FW	2.3.0
Range [units]	OFF, ON [-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object	8482	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Set this setpoint to YES if you want to get messages when a yellow (warning) alarm occurs.			
<p>Note: The target address (cellular network phone number or e-mail address) must be set correctly to the setpoint(s) <i>TelNo/Addr Ch1</i> resp. <i>TelNo/Addr Ch1, 2</i> (page 187).</p>			

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Red Alarm Msg

Setpoint group	Act. Calls/SMS	Related FW	2.3.0
Range [units]	OFF, ON [-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object	8484	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Set this setpoint to YES if you want to get messages when a red (shutdown) alarm occurs.			
<p>Note: The target address (cellular network phone number or e-mail address) must be set correctly to the setpoint(s) <i>TelNo/Addr Ch1</i> resp. <i>TelNo/Addr Ch1, 2</i> (page 187).</p>			

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TelNo/Addr Ch1, 2

Setpoint group	Act. Calls/SMS	Related FW	2.3.0
Range [units]	[-]		
Default value		Force value Alternative config	YES
Step	-		
Comm object	9597	Related applications	
Config level	Standard		
Setpoint visibility	Always		
Description			
Enter either a valid cellular network phone number or e-mail address to this setpoint, where the alarm messages shall be sent. Type of active call is considered from the value of this parameter. If it consist „@“ it is supposed to be e-mail address and active e-mail is sent. If the value is number, without „@“, it is supposed to be the telephone number and active SMS is sent.			
<p>Note: These setpoints can be modified from PC only! For cellular network numbers use either national format (i.e. like number you will dial if you want to make a local call) or full international format with "+" character followed by international prefix at the beginning.</p>			

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9.1.3 Values

What values are:

Values are displayed on the controller screen or are accessible via icon  in the LiteEdit PC tool. See the table with all visible values in LiteEdit.

Note: Some engine values (*) are visible only if the ECU unit is configured.

Groups	Name	Note
Load limit	LoadLimitOut	
Engine values	RPM RPM-BI3 ECU State (*) ECU FreqSelect (*) SpeedReq Abs SpeedReq Rel (*) Engine Speed Fuel Rate (*) CoolantTemp (*) Intake Temp (*) Oil Press (*) Boost Press (*) Oil Temp (*) ECU-AIN 8 (*) ECU-AIN 9 (*) FuelUsed (*) DPF1 Soot Load (*) DPF1 Ash Load (*)	If ECU is not configured, then is displayed only RPM, RPM-BI3 and SpeedReq Abs
Statistic	Run hrs Num starts NextServTime E-Stop ShutDown DayCons TripCons	
Analog CU	Ubat D+ OilPressure Engine Temp Fuel level AIN4-AIN9	Analog inputs are shown depends on if they are configured or not

Groups	Name	Note
Binary I/O	BIN BOUT RemoteControl	Binary states are displayed and is possible to use extract menu button for more details
Date/Time	Time Date	
ID info	Engine state Timer text Timer val SW version Application SW branch PasswordDecode GSM SignalLvl GSM ErrorRate GSM DiagCode: AirGate Diag: AirGate ID: Modem Status:	
Iveco Values	DEF TankLevel DEF TankTemp DEF Quantity Catal UpTemp Catal DownTemp DEF Pressure Catalyst Level	Values read from specific type of ECU
AIO module	AnInAIO1-AnInAIO4	

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9.1.4 Logical binary inputs

Note: Any Binary input can be configured to any IntelliDrive Lite controller terminal or changed to different function by LiteEdit PC tool. There is adjustable delay when any binary input is configured as protection.

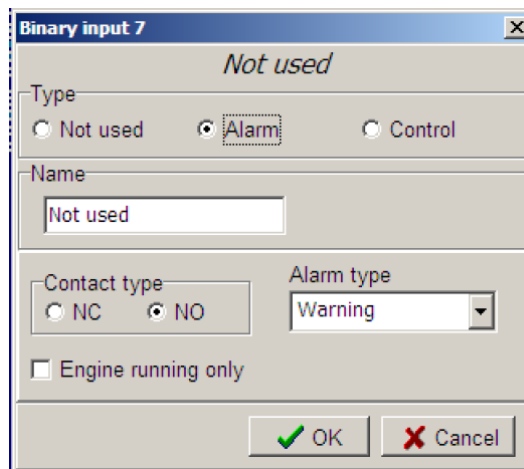
Binary inputs IntelliDrive Lite – default configuration

- ▶ B11 – Rem start/stop
- ▶ B12 – Access lock
- ▶ B13 – Emergency stop
- ▶ B14 – Remote OFF
- ▶ B15 – Sprinkler
- ▶ B16 – RemControlLock
- ▶ B17 – Not used

Configuration of binary inputs

Each binary input can be configured in several ways. The settings can be made in the PC program LiteEdit, in window Modify. After choosing a concrete binary input, its window appears where the user can choose if the binary input will be used to protect (option Alarm) or control (option Control).

Binary Alarm configuration items – see the picture and the table with explanations.



Name		14 characters ASCII string
Contact type	NC	Normally closed
	NO	Normally opened
Alarm type	Warning	
	Shut down	
Alarm active	All the time	
	Engine running only	

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objects**

Not used

Related FW	2.3.0	Related applications	
Comm object	184		
Description			
Binary input has no function. Use this option when binary input is not connected.			

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Rem start/stop

Related FW	2.3.0	Related applications	
Comm object	172		
Description			
Binary input is used for external request for engine run in AUT mode only.			

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Emergency stop

Related FW	2.3.0	Related applications	
Comm object	40		
Description			
If the input is opened, shut down is immediately activated. Input is inverted (normally closed) in default configuration.			
<p>Note: <i>In case of controller hardware or software fail, safe stop of the engine doesn't have to be ensured. To back-up the Emergency stop function it is recommended to connect separate circuit for disconnection of Fuel solenoid and Starter signals.</i></p>			

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Sprinkler

Related FW	2.3.0	Related applications	
Comm object	44		
Description			
If the input is closed all alarms are disabled except the binary input Emergency stop and "engine overspeed protection".			
<ul style="list-style-type: none"> ▶ All IntelliDrive Lite alarms are detected, ▶ IntelliDrive Lite front panel RED LED blinks or lights, ▶ Alarm is recorded on the IntelliDrive Lite alarm list screen, ▶ BUT engine remains running. 			
<p>Note: <i>Warning SprinklActive is indicated in the Alarm list if sprinkler mode active to inform the operator that the engine is not protected.</i></p>			

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Access lock

Related FW	2.3.0	Related applications	
Comm object	149		
Description			
If the input is closed, no setpoints can be adjusted from controller front panel and engine mode (OFF-MAN-AUT) cannot be changed.			
<i>Note: Access lock does not protect setpoints and mode changing from LiteEdit. To avoid unqualified changes the selected setpoints can be password protected.</i>			

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Remote OFF

Related FW	2.3.0	Related applications	
Comm object	185		
Description			
If closed, IntelliDrive Lite is switched to OFF mode (there are three modes OFF-MAN-AUT). When opens controller is switched back to previous mode.			
<i>Note: This binary input should be connected to schedule timer switch, to avoid start of engine.</i>			

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Remote MAN

Related FW	2.3.0	Related applications	
Comm object	186		
Description			
If the input is active, MAN mode is forced to the controller independently on the position of the MODE selector.			

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Remote AUT

Related FW	2.3.0	Related applications	
Comm object	187		
Description			
If the input is active, AUT mode is forced to the controller independently on the position of the MODE selector. If another of remote inputs is active, then the Remote AUT input has the lowest priority.			

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RemControlLock

Related FW	2.3.0	Related applications	
Comm object	198		
Description			
If the input is active, setpoints writing or command sending from the external terminal is disabled.			

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Emerg. manual

Related FW	2.3.0	Related applications	
Comm object	45		
Description			
<p>If the input is activated the controller behaves like when switched to OFF mode and opens all binary outputs. There is one exception – Stop solenoid doesn't activate on this transition.</p> <p>Detection of running engine and subsequent alarm message "Sd Stop fail" is blocked.</p> <p>The controller shows "Emerg Man" state and the engine can not be started.</p> <p>After the input is open again, the controller recovers to previous state and behaves according to the actual situation.</p> <p>Function is active in any controller mode.</p>			

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StartButton

Related FW	2.3.0	Related applications	
Comm object	189		
Description			
<p>Binary input has the same function as Start button on the IntelliDrive Lite front panel. It is active in MAN mode only.</p>			

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StopButton

Related FW	2.3.0	Related applications	
Comm object	190		
Description			
<p>Binary input has the same function as Stop button on the IntelliDrive Lite front panel. It is active in MAN mode only.</p>			

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FaultResButton

Related FW	2.3.0	Related applications	
Comm object	191		
Description			
<p>Binary input has the same function as Fault reset button on the IntelliDrive Lite front panel.</p>			

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HornResButton

Related FW	2.3.0	Related applications	
Comm object	192		
Description			
<p>Binary input has the same function as Horn reset button on the IntelliDrive Lite front panel.</p>			

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Speed Sel1

Related FW	2.3.0	Related applications	
Comm object	710		
Description			
If the input is active, the Speed request = BI Speed Sel 1 (page 126) . The function is affected by RetToSpeedAdj (page 124) .			
Note: See <i>Speed request chart (page 61)</i> .			

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Speed Sel2

Related FW	2.3.0	Related applications	
Comm object	711		
Description			
If the input is active, the BI Speed Sel 2 (page 127) may give the engine speed value for Speed request to an ECU engine. The Speed Request value may also depend on the conditions which are described in the chapter below.			
Note: See <i>Speed request chart (page 61)</i> .			

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Speed Sel3

Related FW	2.3.0	Related applications	
Comm object	712		
Description			
If the input is active, the BI Speed Sel 3 (page 127) may give the engine speed value for Speed request to an ECU engine. The Speed Request value may also depend on the conditions which are described in the chapter below.			
Note: <i>RetToSpeedAdj (page 124) = DISABLED, Speed request is adjusted by BI Speed Sel1, 2, 3 edge (button press), i.e. input can be opened and Speed request stay constant.</i>			
Note: <i>RetToSpeedAdj (page 124) = ENABLED, Speed request is adjusted by BI Speed Sel1, 2, 3 level (switch), i.e. when input is opened Speed request go back to ECU SpeedAdj (page 124) level.</i>			
Note: <i>SpeedSel1, 2, 3 binary inputs are active only when LAI SpdRequest (page 132) = OFF.</i>			
Note: <i>When more binary inputs are active at the same time, e.g. all binary inputs: 'Speed Sel1', 'Speed Sel2', 'Speed Sel3' then requested speed is given by BI Speed Sel 1 (page 126) (lowest index) setpoint.</i>			
Note: See <i>Speed request chart (page 61)</i> .			

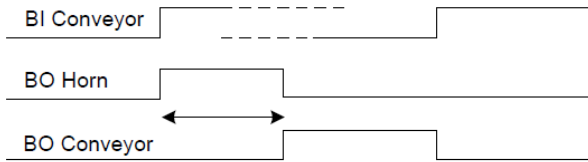
◀ back to List of LBI

Lang selection

Related FW	2.3.0	Related applications	
Comm object	107		
Description			
Switch display texts between two languages.			

⬅ back to List of LBI

Conveyor

Related FW	2.3.0	Related applications	
Comm object	312		
Description			
Initial condition: Running engine.			
Rising edge CONVEYOR (PAGE 197) activates HORN (PAGE 205) for Conveyor horn (page 130). And after horn is over activates the BO Conveyor.			
The second rising edge of CONVEYOR (PAGE 197) opens the BO Conveyor. BO Conveyor is deactivated in case of Sd protection.			
			

⬅ back to List of LBI

LoadRequest2

Related FW	2.3.0	Related applications	
Comm object	313		
Description			
Active input switches the Load limit request to Load request 2 (page 139) setpoint.			

⬅ back to List of LBI

LoadRegDisable

Related FW	2.3.0	Related applications	
Comm object	314		
Description			
Active input disables the Load limit PI loop and switches analog output to constant Load Bias (page 139).			

⬅ back to List of LBI

RegRequest2

Related FW	2.3.0	Related applications	
Comm object	315		
Description			
Active input switches the Regulator limit request to Request 2 (page 133) setpoint.			

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R Reg Disable

Related FW	2.3.0	Related applications	
Comm object	316		
Description			
Active input disables the Regulator PI loop and switches analog output to constant Reg Bias (page 133) .			

[back to List of LBI](#)

Clear DayCons

Related FW	2.3.0	Related applications	
Comm object	220		
Description			
DayCons is the counter which cumulates the instantaneous consumption coming from ECU . It shows the total consumption since the counter reset. Counte reset happen at the midnight of the controller clocks. LBI Clear DayCons resets the counter DayCons.			
<p>Note: The function works when the controller is connected to an ECU or in other case is consumption counted from the changes of analog input value Fuel rate and setpoint FuelTankVolume (page 130).</p>			

[back to List of LBI](#)

Clear TripCons

Related FW	2.3.0	Related applications	
Comm object	221		
Description			
TripCon is the counter which cumulates the instantaneous consumption coming from ECU. It shows the total consumption since last reset by LBI Clear TripCon. This LBI resets the counter TripCons.			
<p>Note: The function works when the controller is connected to an ECU or in other case is consumption counted from the changes of analog input value Fuel rate and setpoint FuelTankVolume (page 130).</p>			

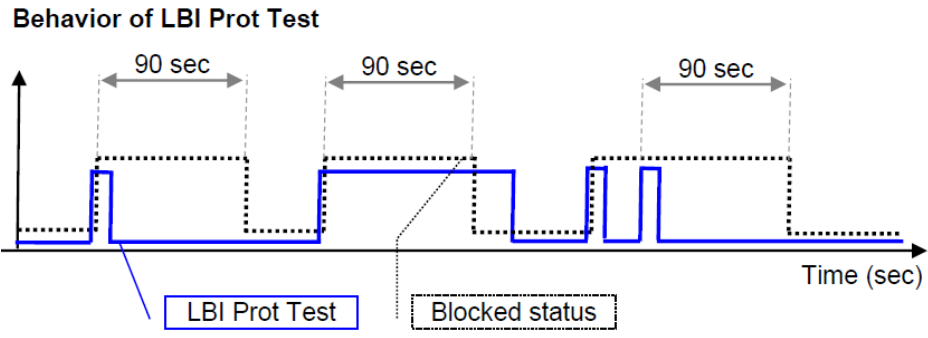
[back to List of LBI](#)

Flow Switch

Related FW	2.3.0	Related applications	
Comm object	398		
Description			
FlowSwitch is protection to stop the engine in case the water not flow. Function is active in MAN and AUT mode. Engine is switched to Cooling state when FlowSwitch is not closed within Flow SwitchDel (page 145) after running (Ready to load) engine state activation. Function stops the engine in AUT mode with FlowSwitch indication in Alarm list and stays in AUT mode after Fault reset.			
Alarm list and History indication = "Cd Flow Switch" (CoolDown is third engine protection type in IntelliDrive Lite).			
Machine state stays in Cooling even the LBI FLow Switch is activated again during Cooling period.			

[back to List of LBI](#)

Prot Test

Related FW	2.3.0	Related applications	
Comm object	920		
Description			
<p>When the new LBI Protection Test is activated (by rising edge), all Sd alarms are for 90 s blocked. The exception is LBI Emergency stop and Overspeed protection.</p>			
<p style="text-align: center;">Behavior of LBI Prot Test</p>  <p>The diagram illustrates the behavior of the LBI Protection Test. The x-axis represents Time (sec) and the y-axis represents the state of the test. A solid blue line shows the LBI Prot Test signal, which consists of three distinct pulses. Each pulse is followed by a 90-second period where the Blocked status is active, indicated by a dotted line. The duration of each blocked period is explicitly labeled as 90 sec. A legend at the bottom identifies the solid blue line as 'LBI Prot Test' and the dotted line as 'Blocked status'.</p>			

[◀ back to List of LBI](#)

9.1.5 Logical binary outputs

Note: Any Binary input can be configured to any IntelliDrive Lite controller terminal or changed to different function by LiteEdit PC tool. There is adjustable delay when any binary input is configured as protection.

Binary outputs IntelliDrive Lite – default

- ▶ BO1 – Starter
- ▶ BO2 – Fuel solenoid
- ▶ BO3 – Prestart
- ▶ BO4 – Alarm
- ▶ BO5 – Horn
- ▶ BO6 – Not used
- ▶ BO7 – Not used

List of LBO

Configuration of binary outputs is feasible easily by combo box menu in the configuration window Modify.

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Stop Pulse	203
Preheat	203
Ignition	203
Prestart	204
Preglow	204
Cooling pump	204
Idle/Nominal	204
Air valves	205
Alarm	205
Horn	205
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Ready to load	206
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Underspeed	208
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Sd AIN4, AIN5, AIN6, AIN7, AIN8, AIN9	213
ECU CommOK	213
ECU CommError	214
ECU YellowLamp	214
ECU RedLamp	214
ECU PwrRelay	214
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SpeedSwitch	216
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Close Load	216
Toggle	216
RemoteControl1, 2, 3, 4, 5, 6, 7, 8	217

 **back to Controller objects**

Starter

Related FW	2.3.0	Related applications	
Comm object	24		
Description			
<p>Closed relay energizes the starter of engine.</p> <p>The relay opens if:</p> <ul style="list-style-type: none"> ▶ The strating speed is reached or ▶ Maximum time of cranking is exceeded or ▶ Request to stop comes up 			

⬅ back to List of LBO

Fuel solenoid

Related FW	2.3.0	Related applications	
Comm object	22		
Description			
<p>Closed output opens the fuel solenoid and enables the engine start.</p> <p>The output opens if:</p> <ul style="list-style-type: none"> ▶ Emergency stop comes or ▶ Cooled engine is stopped or ▶ In pause between repeated starts 			

⬅ back to List of LBO

Stop solenoid

Related FW	2.3.0	Related applications	
Comm object	23		
Description			
<p>The closed output energizes stop solenoid to stop the engine.</p> <p>The output is active at least for Stop time, if the stop lasts longer; it stays active until all symptoms say the engine is stopped.</p> <p>The engine is stopped if:</p> <ul style="list-style-type: none"> ▶ RPM < 2 and ▶ Oil pressure < Starting POil (page 114) <p>Note: The engine can be started anytime, if all symptoms say the engine is steady regardless of the fact the Stop solenoid can still be active (in that case it is deactivated before cranking).</p> <p>Note: In case when stop time period is lower than "stop engine detected" + 10 s, stop time period is extended to this value due to safety reason. (stop engine detected = RPM<2, OilP not detected, D+ not active)</p>			

⬅ back to List of LBO

Stop Pulse

Related FW	2.3.0	Related applications	
Comm object	25		
Description			
Output is active for 1 second after STOP SOLENOID (PAGE 202) activation. This signal is sent to ECU in case of engine stop request.			

🔍 back to List of LBO

Preheat

Related FW	2.3.0	Related applications	N/A
Comm object	1663		
Description			
Activation times prior to engine start:			
<ul style="list-style-type: none"> ▶ If measured temperature is equal to PreheatTemp1 (°C) or lower, the LBO Preheat activates prior to the engine start for time equal to value in setpoint PreheatTime1 (s) ▶ If measured temperature is PreheatTemp2 (°C) or higher, the LBO Preheat activates prior to the engine start for time equal to value in setpoint PreheatTime2 (s) ▶ If the temperature is between the values, the LBO Preheat activates for time calculated by linear approximation ▶ The LBO Preheat is activated before engine start as same as Prestart (page 204) or Preglow (page 204), the time is defined by new setpoints (PreheatTime1/2, PreheatTemp1/2) described below. ▶ Activation of Preheat (page 203) has a variable activation time based on the measured temperature – it can be activated either before or after Prestart LBO and is deactivated during cranking. ▶ Input for temperature measurement is selected by setpoint – PreheatSensor which is described below <ul style="list-style-type: none"> ● In case of invalid value on selected AIN, the LBO preheat will activate for time given by setpoint PreheatTime2 = longest preheat time 			

🔍 back to List of LBO

Ignition

Related FW	2.3.0	Related applications	
Comm object	37		
Description			
The output closes after reaching value of CrankRPM, fixed 30 RPM. The output opens after stopping of the engine or in pause during repeated start.			

🔍 back to List of LBO

Prestart

Related FW	2.3.0	Related applications	
Comm object	36		
Description			
<p>The output closes prior to the engine start (Prestart) and opens when Starting RPM (page 113) speed is reached. During repeated crank attempts the output is closed too.</p> <p>The output could be used for pre-glow, pre-heat or prelubrication.</p>			

🔍 back to List of LBO

Preglow

Related FW	2.3.0	Related applications	
Comm object	574		
Description			
<p>The output closes prior to the engine start and opens when Starting RPM (page 113) speed is reached. During repeated crank attempts the output is closed too.</p> <p>The output could be used for pre-glow or pre-heat.</p>			

🔍 back to List of LBO

Cooling pump

Related FW	2.3.0	Related applications	
Comm object	40		
Description			
<p>The output closes when engine starts and opens after AfterCool time (page 120) after stop of the engine.</p>			

🔍 back to List of LBO

Idle/Nominal

Related FW	2.3.0	Related applications	
Comm object			
Description			
<p>The output either follows the Nominal/Idle binary input or I/O button in MAN mode or follows the engine state in AUT mode:</p> <p>The output Idle/Nominal closes after the timer Idle time elapses. The Idle time counter starts to countdown when Start speed reached. The Underspeed (page 144) is not evaluated during idle time. Start fail protection occurs if the RPM drop below 2RPM during idle state.</p> <p>Note: When LBI NOMINAL/IDLE (PAGE 195) is configured (to a physical binary input), it has priority and the switching between the nominal and the idle speed by I/O button is blocked.</p>			

🔍 back to List of LBO

Air valves

Related FW	2.3.0	Related applications	
Comm object	1247		
Description			
Output closes together with Prestart time (page 114) and opens after the engine is stopped.			
Stopped engine conditions: RPM = 0, Starting POil (page 114) , D+ function (page 123) (if enabled).			

 [back to List of LBO](#)

Alarm

Related FW	2.3.0	Related applications	
Comm object	2		
Description			
The output closes if:			
<ul style="list-style-type: none"> ▶ Any warning, cooldown or shutdown comes up or ▶ The engine malfunctions 			
The output opens if			
<ul style="list-style-type: none"> ▶ FAULT RESET is pressed 			
The output closes again if a new fault comes up.			

 [back to List of LBO](#)

Horn

Related FW	2.3.0	Related applications	
Comm object	1		
Description			
The output closes if:			
<ul style="list-style-type: none"> ▶ Any warning or shutdown comes up or ▶ The engine malfunctions 			
The output opens if:			
<ul style="list-style-type: none"> ▶ FAULT RESET is pressed or ▶ HORN RESET is pressed or ▶ Max time of LBO HORN is exceeded (Horn timeout) 			
The output closes again if a new fault comes up.			

 [back to List of LBO](#)

Ready

Related FW	2.3.0	Related applications	
Comm object	62		
Description			
The output is closed if following conditions are fulfilled:			
<ul style="list-style-type: none"> ▶ Engine is not running and ▶ No Shut down or Slow stop alarm is active ▶ Controller is not in OFF mode 			

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Ready to load

Related FW	2.3.0	Related applications	
Comm object	58		
Description			
The output is closed if engine is running and no alarm is active – it is possible to close load. The output opens when Wm Underspeed protection is active and during cooling state.			

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Running

Related FW	2.3.0	Related applications	
Comm object	67		
Description			
Output closes if the engine is in Running state.			

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Cooling

Related FW	2.3.0	Related applications	
Comm object	74		
Description			
The output closes when engine is in Cooling state.			

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Fault Reset

Related FW	2.3.0	Related applications	
Comm object	592		
Description			
One second pulse as echo for panel Fault reset button.			

[◀ back to List of LBO](#)

ChrgAlternFail

Related FW	2.3.0	Related applications	
Comm object	1260		
Description			
Output closes if engine is running and D+ input not energized.			
The output opens, if:			
<ul style="list-style-type: none"> ▶ Alarm is not active and ▶ FAULT RESET is pressed 			
<i>Note: Threshold level for D+ input is 80% supply voltage.</i>			

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Stop failed

Related FW	2.3.0	Related applications	
Comm object	339		
Description			
Output closes when the engine has to be stopped, but speed or oil pressure is detected. This protection goes active 60s after stop command.			
The output opens, if			
<ul style="list-style-type: none"> ▶ Alarm is not active and ▶ FAULT RESET is pressed 			

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Overspeed

Related FW	2.3.0	Related applications	
Comm object	779		
Description			
Output closes if the engine over speed alarm activates.			
The output opens, if			
<ul style="list-style-type: none"> ▶ Alarm is not active and ▶ FAULT RESET is pressed 			

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Underspeed

Related FW	2.3.0	Related applications	
Comm object	1296		
Description			
Output closes if the engine “Sd Underspeed” alarm activates i.e. when RPM is below the Starting RPM (page 113) limit.			
The output opens, if			
<ul style="list-style-type: none"> ▶ Alarm is not active and ▶ FAULT RESET is pressed 			

⬅ back to List of LBO

Start failed

Related FW	2.3.0	Related applications	
Comm object	1291		
Description			
Output closes after the engine start-up fails.			
The output opens, if			
<ul style="list-style-type: none"> ▶ Alarm is not active and ▶ FAULT RESET is pressed 			

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Battery flat

Related FW	2.3.0	Related applications	
Comm object	1292		
Description			
Output closes when IntelliDrive Lite performs reset during start procedure (probably due to weak battery).			
The output opens, if			
<ul style="list-style-type: none"> ▶ Alarm is not active and ▶ FAULT RESET is pressed 			

⬅ back to List of LBO

V batt failed

Related FW	2.3.0	Related applications	
Comm object	928		
Description			
Output closes when battery over/under voltage warning appears.			
The output opens, if			
<ul style="list-style-type: none"> ▶ Alarm is not active and ▶ FAULT RESET is pressed 			

⬅ back to List of LBO

Common Wrn

Related FW	2.3.0	Related applications	
Comm object	3		
Description			
Output closes when any warning alarm appears.			
The output opens, if			
<ul style="list-style-type: none"> ▶ No warning alarm is active and ▶ FAULT RESET is pressed 			

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Common Sd

Related FW	2.3.0	Related applications	
Comm object	4		
Description			
Output closes when any shutdown alarm appears.			
The output opens, if			
<ul style="list-style-type: none"> ▶ No Sd alarm is active and ▶ FAULT RESET is pressed 			

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Common Cd

Related FW	2.3.0	Related applications	
Comm object	257		
Description			
Output closes when any cooldown alarm appears.			
The output opens, if			
<ul style="list-style-type: none"> ▶ No Cd alarm is active and ▶ FAULT RESET is pressed 			

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Common Fls

Related FW	2.3.0	Related applications	
Comm object	6		
Description			
Output closes when any sensor fail alarm appears.			
The output opens, if			
<ul style="list-style-type: none"> ▶ No warning alarm is active and ▶ FAULT RESET is pressed 			

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Sd Oil Press

Related FW	2.3.0	Related applications	
Comm object	522		
Description			
Output closes if the oil pressure shutdown alarm activates.			
The output opens, if			
<ul style="list-style-type: none"> ▶ Alarm is not active and ▶ FAULT RESET is pressed 			

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Wrn Oil Press

Related FW	2.3.0	Related applications	
Comm object	522		
Description			
Output closes if the oil pressure warning alarm activates.			
The output opens, if			
<ul style="list-style-type: none"> ▶ Alarm is not active and ▶ FAULT RESET is pressed 			

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Sd Engine Temp

Related FW	2.3.0	Related applications	
Comm object			
Description			
Output closes if the water temperature shutdown alarm activates.			
The output opens, if			
<ul style="list-style-type: none"> ▶ Alarm is not active and ▶ FAULT RESET is pressed 			

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Wrn Engine Temp

Related FW	2.3.0	Related applications	
Comm object	10		
Description			
Output closes if the water temperature warning alarm activates.			
The output opens, if			
<ul style="list-style-type: none"> ▶ Alarm is not active and ▶ FAULT RESET is pressed 			

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Sd FuelLevel

Related FW	2.3.0	Related applications	
Comm object	525		
Description			
Output closes if the Fuel level shutdown alarm activates.			
The output opens, if			
<ul style="list-style-type: none"> ▶ Alarm is not active and ▶ FAULT RESET is pressed 			

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Wrn FuelLevel

Related FW	2.3.0	Related applications	
Comm object	526		
Description			
Output closes if the Fuel level warning alarm activates.			
The output opens, if			
<ul style="list-style-type: none"> ▶ Alarm is not active and ▶ FAULT RESET is pressed 			

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OFF mode

Related FW	2.3.0	Related applications	
Comm object	291		
Description			
The output is closed, if OFF mode is selected.			

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MAN mode

Related FW	2.3.0	Related applications	
Comm object	292		
Description			
The output is closed, if MAN mode is selected.			

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AUT mode

Related FW	2.3.0	Related applications	
Comm object	293		
Description			
The output is closed, if AUT mode is selected.			

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ServiceTime

Related FW	2.3.0	Related applications	
Comm object	422		
Description			
Output closes if the ServiceTime alarm activates. Service time is adjusted by setpoint NextServTime (page 169).			
The output opens, if			
<ul style="list-style-type: none"> ▶ Alarm is not active and ▶ FAULT RESET is pressed 			

[◀ back to List of LBO](#)

DEF Tank Level

Related FW	2.3.0	Related applications	
Comm object	1161		
Description			
Output closes if the value DEF Tank Level drops under 10%, this level is adjustable in DEF Level Min (page 174).			
Outup opens if the value DEF Tank Level exceeds 90%. This upper limit is adjusted in DEF Level Max (page 175).			
<i>Note: This output is working only under condition ECU is configured and engine is in running state.</i>			

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BI1, BI2, BI3, BI4, BI5, BI6, BI7, BI8, BI9, BI10 - stat

Related FW	2.3.0	Related applications	
Comm object	298		
Description			
In case the binary input is configured to any control function, the binary output depicts the state of the binary input. BI1, BI2, BI3, BI4, BI5, BI6 are assigned for controller binary inputs, BI7, BI8, BI9, BI10 are assigned for IL-NT IO1 optional card.			

[◀ back to List of LBO](#)

CtrlHeartBeat

Related FW	2.3.0	Related applications	
Comm object	1192		
Description			
The output signalizes watchdog reset. In a healthy state it flashes at 500 ms : 500 ms rate. It stops flashing when the unit reset occurs and the new controller start-up fails.			

[◀ back to List of LBO](#)

BIO8 1, 2, 3, 4, 5, 6, 7, 8 Status

Related FW	2.3.0	Related applications	
Comm object	564		
Description			
In case the assigned binary input of IL-NT BIO8 optional card is configured to any control function, the output propagates the state of the input.			
<i>Note: These binary outputs are possible to configure only if the IL-NT BIO8 is configured.</i>			

[▲ back to List of LBO](#)

Wrn AIN4, AIN5, AIN6, AIN7, AIN8, AIN9

Related FW	2.3.0	Related applications	
Comm object	1518		
Description			
Output closes if the warning alarms for AIN4, AIN5, AIN6, AIN7, AIN8, AIN9 activates.			
The output opens, if			
<ul style="list-style-type: none"> ▶ Alarm is not active and ▶ FAULT RESET is pressed 			

[▲ back to List of LBO](#)

Sd AIN4, AIN5, AIN6, AIN7, AIN8, AIN9

Related FW	2.3.0	Related applications	
Comm object	1522		
Description			
Output closes if the shutdown alarms for AIN4, AIN5, AIN6, AIN7, AIN8, AIN9 activates.			
The output opens, if			
<ul style="list-style-type: none"> ▶ Alarm is not active and ▶ FAULT RESET is pressed 			

[▲ back to List of LBO](#)

ECU CommOK

Related FW	2.3.0	Related applications	
Comm object	347		
Description			
If the ECU is not communicating and all values from ECU show ##### the output is not active. If the ECU communicates the output is active.			

[▲ back to List of LBO](#)

ECU CommError

Related FW	2.3.0	Related applications	
Comm object	348		
Description			
The output is an inversion of binary output ECU CommOK, i.e. the output is closed when ECU is not communicating and all values from ECU show #####.			

[back to List of LBO](#)

ECU YellowLamp

Related FW	2.3.0	Related applications	
Comm object	349		
Description			
The output copies warning information from ECU.			

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ECU RedLamp

Related FW	2.3.0	Related applications	
Comm object	350		
Description			
The output copies shutdown information from ECU.			

[back to List of LBO](#)

ECU PwrRelay

Related FW	2.3.0	Related applications	
Comm object	351		
Description			
The output closes at the beginning of prestart and opens if the engine shall be stopped.			
<i>Note: ECU binary outputs are possible to configure only if ECU is configured.</i>			

[back to List of LBO](#)

Timer1

Related FW	2.3.0	Related applications	
Comm object	436		
Description			
Output activates when Timer1 is active. Simultaneously the engine is started when is in AUT mode.			

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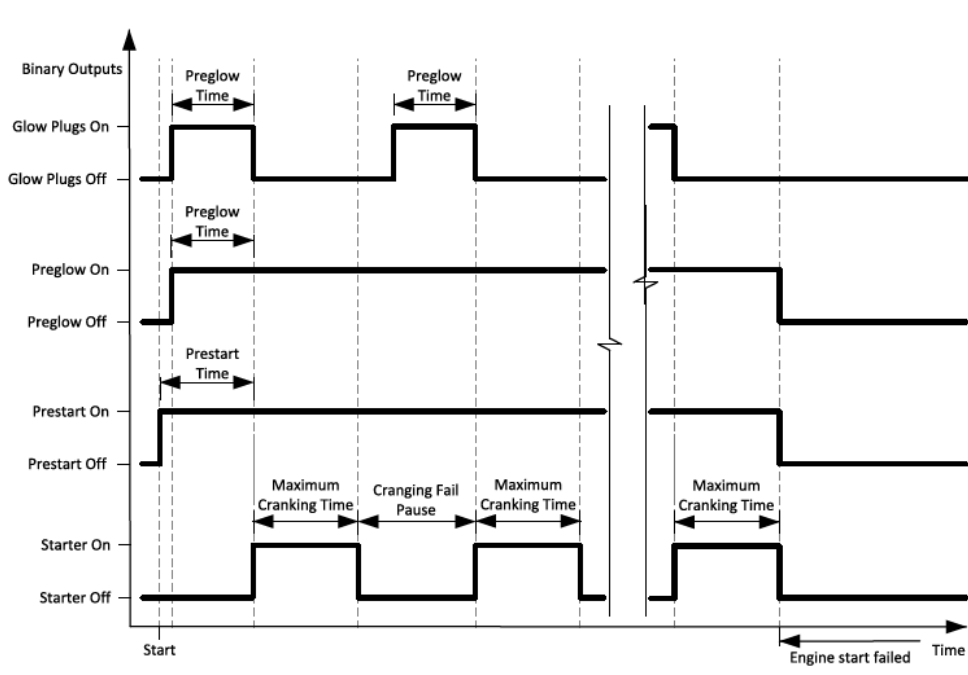
Timer2

Related FW	2.3.0	Related applications	
Comm object	437		
Description			
Output activates when Timer2 is active. Simultaneously the engine is started when is in AUT mode.			

◀ back to List of LBO

Glow plugs

Related FW	2.3.0	Related applications	
Comm object	1252		
Description			
The output closes prior to the engine start (Prestart) and opens when Starting RPM (page 113) speed is reached. During repeated crank attempts the output is opened.			



The diagram illustrates the timing of various binary outputs during engine start. It shows two successful start attempts and one failed attempt. Key events include Preglow Time, Prestart Time, Maximum Cranking Time, Cranking Fail Pause, and Engine start failed.

◀ back to List of LBO

Conveyor

Related FW	2.3.0	Related applications	
Comm object	589		
Description			
Binary output function of Conveyor. See CONVEYOR (PAGE 197).			

◀ back to List of LBO

SpeedSwitch

Related FW	2.3.0	Related applications	
Comm object	590		
Description			
Binary output from Speed switch comparator – see Group: Regulator on page 131.			

[▲ back to List of LBO](#)

LoadSwitch

Related FW	2.3.0	Related applications	
Comm object	591		
Description			
Binary output from Load switch comparator – see Group: Load limit on page 138.			

[▲ back to List of LBO](#)

Close Load

Related FW	2.3.0	Related applications	
Comm object	265		
Description			
Output is controlled by panel 0/1 button when Panel Button (page 100) = Close Load, engine is running and no Sd/Cd alarm is active. Close Load output is not closed in Idle and Cooling states and is disconnected when any Sd/Cd alarm is activated.			


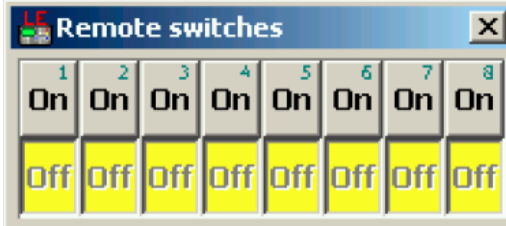
[▲ back to List of LBO](#)

Toggle

Related FW	2.3.0	Related applications	
Comm object	756		
Description			
Output is controlled by panel 0/1 button when Panel Button (page 100) = Toggle. This setting changes the Toggle output without any relation to Engine state or Alarm activity even if in OFF mode.			

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RemoteControl1, 2, 3, 4, 5, 6, 7, 8

Related FW	2.3.0	Related applications	
Comm object	661		
Description			
Allows configure Remote control switches to physical binary outputs. These switches are accessible from PC tools LiteEdit (see picture below) or IntelIMonitor by button  and it can be controlled via Modbus communication.			
			

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9.2 Extension modules

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9.2.1 IL-NT RS232 (optional card)

Plug-in into IntelliDrive Lite controller COMMUNICATION MODULE port.

Maximal distance	10 m
Speed	19.2 kBd (STD) 9.6 kBd (MODBUS)

Recommend external converter:

ADVANTECH – ADAM 4520: RS232 to RS232/RS485 converter, DIN rail, automatic RS485 bus supervision, no external data flow control signals, galvanic isolated.

Recommended internal converter:

ADVANTECH – PCL-745B or PCL745S : Dual port RS232/RS485 Interface card, automatic RS485 bus supervision, no external data flow control signals, galvanic isolated.

9.2.2 IL-NT RS232/485 (optional card)

Plug-in into IntelliDrive Lite controller COMMUNICATION MODULE port.

Maximal distance	10 m (RS232), 1200 m (RS485)
Speed	Up to 57.6 kBd (DIRECT), 38.4kBd Analog modem, 9.6 kBd digital modem, 57.6 kBd (MODBUS)

9.2.3 IL-NT S-USB (optional card)

Plug-in into IntelliDrive Lite controller COMMUNICATION MODULE port.

Maximal distance	5 m
Speed	Up to 57.6 kBd (DIRECT), 38.4 kBd Analog modem, 9.6 kBd digital modem, 57.6 kBd (MODBUS)

Use only shielded A-B USB cables up to 5 m length.

Recommend USB cable:

USB-LINK CABLE 1.8M - ComAp A-B USB cable.

9.2.4 IB-Lite (optional card)

Plug-in into IntelliDrive Lite controller COMMUNICATION MODULE port.

10/100 MBit Ethernet interface in RJ45 socket.

9.2.5 IL-NT GPRS (optional card)

Plug-in into IntelliDrive Lite controller COMMUNICATION MODULE port.

Quad Band	850 / 900 / 1800 / 1900 MHz
GPRS multi-slot	class 10
CSD communication	up to 14.4 kbps
TCP/IP communication	over GPRS
Voltage supply 8-36 V DC	

9.2.6 IL-NT AOUT8 (optional card)

Plug-in into IntelliDrive Lite controller EXTENSION MODULE port.

Number of PWM outputs	8
PWM frequency	1200 Hz
Maximum current	0.5 A
Maximum switching voltage	36 V DC
Output resistance	1 Ω
Resolution	10 bits

9.2.7 IL-NT AIO (optional card)

Plug-in into IntelliDrive Lite controller EXTENSION MODULE port.

Resolution	10 bits
Number of Analog inputs	4 (2400 Ω , 20 mA, 4 V)
Maximal resistance range	2400 Ω
Maximal voltage range	4 V
Current range	0-20 mA
Input impedance (current)	180 Ω for mA measuring
Input impedance (voltage)	>68 k Ω for V measuring
Resistance measurement tolerance	$\pm 2\%$ $\pm 2\ \Omega$
Voltage measurement tolerance	$\pm 1\%$ $\pm 1\ \text{mV}$
Current measurement tolerance	$\pm 2\%$ $\pm 0.2\ \text{mA}$
Number of Analog outputs	1 (21 mA, max.load 100 Ω ; 4.6 V, max. 10 mA; PWM 500 Hz (5 V / 10 mA)
Voltage measurement tolerance	$\pm 1.5\%$ $\pm 10\ \text{mV}$
Current measurement tolerance	$\pm 2\%$ $\pm 0.1\ \text{mA}$

9.2.8 IL-NT IO1 (optional card)

Plug-in into IntelliDrive Lite controller EXTENSION MODULE port.

Number of Analog outputs	4
Analog output range	0 to +VBatt \pm 1 V
Number of Binary inputs	4

9.2.9 IL-NT BIO8 (optional card)

Plug-in into IntelliDrive Lite controller EXTENSION MODULE port.

Number of Binary inputs/outputs	8 (configurable as input or output)
Maximal one Binary output current	0.4 A
Maximal total current per module	2.5 A

9.2.10 IGL-RA15 (Remote Annunciator)

Order code:

- ▶ EM2IGLRABAA
- ▶ EM2FPCRAEAA

Power supply

Voltage supply	8-36 V DC
Consumption	0.35-0.1 A (+1 A max horn output), depends on supply voltage

Operating conditions

Operating temperature	-20 °C to +70 °C
Storage temperature	-30 °C to +80 °C
Protection front panel	IP65

Dimensions and weight

Dimensions	180 × 120 × 55 mm
Weight	950 g

Horn output

Maximum current	1 A
Maximum switching voltage	36 V DC

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